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OFFICIAL ORGAN OF THE NEW ZEALAND FRUIT-EXPORT CONTROL BOARD

IMPERIAL BUREAU
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Hawkes Bay Orchardists' Field Day.

H. V. Whitehead photo.

Mr. Ralph Paynter (President) addressing the gathering at "Grassmere."

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Topical Notes

Market Returns.

We are able to present this month a further series of price averages in connection with shipments to the United Kingdom, based on account sales. Low returns are being indicated in the High Commissioner's weekly price cables, and they cannot give much encouragement to growers. The heavy cool store accumulation has come down rapidly, for on August 23rd. the Control Board received a cable from Mr. Stephens that the total in cool store was 20,000 cases. Whether this is an indication of a stronger market, or a sign that it was considered unwise to hold off any longer, we must leave for further advices to explain. The net average prices from the Hororata shipment, which are the last to hand, were as follow: Delicious Extra Fancy 13/2, Fancy 13/2, Statesman 11/1, Tasma and Rome Beauty 12/6, other varieties 11/2. There were 800 broken and ullaged cases, which produced a net average of 9/1. These figures are net averages, not gross, an important difference which exporters will understand.

Mr. Napier Returning.

There is evidence in this issue that Mr. Napier has begun to put on record valuable impressions formed during his visit to the United Kingdom. He is due to leave on the return journey on September 6th., and is to spend some time in Canada, possibly three weeks, investigating conditions in view of the possibility of an expanding business with that country. After the treatment Canadian agriculturists have received from the United States in the last tariff revision we may find that New Zealand products will be more welcomed, though it must be admitted that at the moment, the retaliatory duties on Canadian motors do not suggest much along these lines. This, however, is probably a passing phase, a bargaining weapon which Mr. Forbes will in due course turn to good account for our producers. Mr. Napier is expected to reach New Zealand about the first week in December.

Marketing Investigation.

A good deal of useful evidence from the fruitgrowers' viewpoint has been presented to the Select Committee of the House of Representatives, which is still investigating the conditions of marketing fruit and vegetables in the Dominion. We will not at this stage comment on the proceedings except to make one helpful suggestion, namely, that the Committee will scarcely get a really "inside" view of the position unless it calls for evidence which its members should realise, from that already presented, is essential to properly understand the position. Such an investigation, to be effective, must be thorough, and not based merely on evidence volunteered. Tasmania has taken such action. It has set up a Royal Commission to look into the export side. That Commission has been definitely instructed to inquire into and report upon the following matters:—

(*a*) Method in use of allotting shipping space to fruitgrowers.

(*b*) The congestion of fruit at the wharves during the export season.

(*c*) Carriage of fruit during the season.

(*d*) Shipment of fruit to ports other than those to which it was consigned, and by vessels other than those by which it was consigned.

(*e*) All charges made and levied for fruit consigned for exportation.

(*f*) And all other matters and things incidental to the foregoing.

The Sticker Competition.

We direct the attention of our readers to the details in this issue of a competition promoted by the Fruit-export Control Board with our co-operation, to secure useful suggestions on the question of marking for export, with the object—if the suggestions warrant it—of providing an alternative to the present sticker system. The necessity for this system of marking is fully explained in the article, and we look forward with interest and keen expectation to receiving a large number of good suggestions.

THE EXPORT STICKER—WHAT CAN REPLACE IT?

FRUIT BOARD INAUGURATES A COMPETITION.

Export fruitgrowers probably regard the sticker system of marking as a necessary evil, and they would like to see it replaced by some method involving less trouble, but giving at least the same advantages in our rapidly growing export business. Now is the chance for people with ideas! This article gives the history of the sticker system, what it aims at, and concludes with an invitation to all to submit alternative schemes and win one of the prizes offered for the best suggestions.

Is there a New Zealand fruit exporter who does not know what a "sticker" is? Readers who have not been actually associated with the preparation of export fruit may assume that if the term is applied to growers, in the sense of "one who clings closely to his labour," the word would certainly apply to our exporters. The term, however, has a technical meaning which should be explained for the benefit of those who are not exporters. It describes a small printed—and often coloured—oblong label which is pasted or stuck on the face of the bigger label.

Stickers have been known to our exporters for a long time. They came into use at the beginning of our export trade, but it is only within the last two seasons that they have been incorporated into export requirements. It is well known to most of our readers that export arrangements have undergone many changes since 1919. Changes have been so frequent and at times so surprising that exporters await the announcements as eagerly as politicians await the Budget. Stickers came in for universal use as one of those changes. It never was contended that the sticker system was ideal; on the contrary it has always been thought that if it proved cumbersome that through the amending of defects better results would be secured. Until this happens the sticker is considered the best means of securing the desired market distribution.

LOOKING FOR ALTERNATIVES.

No one is in favour of the sticker system. A few openly detest it, while the majority accept it with patient tolerance and charitable resignation. When it was first introduced it was hoped it would be a passing stage, but when the Nelson delegates at the Dominion Conference of the Fruitgrowers' Federation suggested that there should be a competition for suggestions to replace the sticker system, the idea met unanimous approval. The Federation forwarded the suggestion to the Fruit-export Control Board, with the result that the Board gave ready consent, and this article announces the competition. It is hoped that it will create widespread interest among exporters, and should result in the elimination of the present "necessary evil"—the sticker—because it is hoped to secure acceptable suggestions for an alternative.

To assist intending competitors we will explain why the sticker was introduced, what are its functions, advantages and disadvantages. In 1928 it was found that the multiplicity of shipping marks in use in the Dominion had grown to such an extent that they were unwieldy. The clerical work in preparing full specifications of the fruit on an overseas vessel, and the short time available to prepare those specifications, was threatening a breakdown. At that time the shipping mark represented an exporting unit of 20,000 cases—*i.e.*, a grower, Association or district having an export total of 20,000 cases had an individual shipping mark. This applied to all districts except Auckland, where there was a pool with three shipping marks for an export crop of approximately one hundred thousand cases. As there was a yearly increase in our total export crops, so also was there an almost corresponding increase in shipping marks.

These shipping marks were adopted for United Kingdom consignments. Consignments to South America had different shipping marks, three in number, which were universal to all exporting units. At this time there were no direct shipments to the Continent of Europe. In addition to considering the reduction of shipping marks for United Kingdom, three other factors had to be taken into account, namely:

1. The South American consignments had three shipping marks—one each for "Jonathan," "Delicious" and "other reds." This system was not satisfactory in that "other reds" were classed under the one mark. It was felt that this was not conducive to the broker giving actual returns for the various varieties under the "other red" shipping mark. The obvious solution seemed to be a shipping mark for each variety.
2. It was intended that the markets on the Continent of Europe should be supplied by direct shipments. As the fruit for the Continent would be in accord with the market preference for certain varieties and certain sizes it looked as if a separate set of shipping marks for exporting units would be necessary to distinguish the fruit.
3. It was also intended that direct shipments should be made to Canada and the difficulties of this were similar to the Continent.

COMPLICATED SHIPPING MARKS.

The pressing problem was the necessity of securing a reduction in the number of shipping marks, and at the same time extend our sphere of market activity. Without extending our markets, the multiplicity of shipping

marks had a growing tendency, and the number already in use threatened complications which should be avoided. The position, if not serious, was certainly very important. Provision must be made to expand our markets, our increasing crop being only one of the reasons for this necessity. Yet how to do so without increasing shipping marks was really a problem.

A solution was found in changing the basis for the allotment of shipping marks. Instead of the mark representing the exporting unit, it was made to represent the group of fruit brokers selected by the grower. The alteration had a twofold benefit—it gave to the individual the power to select his selling agents in the United Kingdom and it definitely curtailed the number of shipping marks. It was then decided that those same shipping marks could be used for all markets, and to indicate the destination there would be a sticker of a certain colour immediately below the shipping mark. This arrangement had a big advantage in that the growers could regard their United Kingdom labels as universal, and no longer would there be any need to have special label stocks for each special destination. By means of a sticker the label could be used for United Kingdom, Canada, South America or the Continent. Blue stickers were adopted for the Continent, red for South America, black for Canada, and green for the United Kingdom. Through these arrangements the shipping mark problem was solved, variety of growers' label stocks reduced, and selection of brokers granted.

DISCRIMINATION IN SIZES.

Shortly after making these arrangements several growers made a request to the Board to arrange discriminating marketing by consigning the small sizes and the big sizes of apples to the markets which would give the best returns. This request probably arose through the beneficial results of the Auckland pooling system. In this system the shipping mark indicated the sizes and the fruit sold in appropriate markets. As is well known, this request has been met by adopting the three types of sticker—one each for large, medium, and small fruit. The original idea to distinguish each size group by the letters A B C was not adopted the first year, as it was thought buyers might imagine these letters to be connected with the quality of the fruit. At a later date, however, it was decided to adopt this code.

A further expansion of the sticker system was the adoption of the round sticker to represent varieties suitable only for the South of England markets. Unfortunately, the round sticker has also been used to indicate small sizes in the United Kingdom markets. At present it appears as if this is not giving best results, and it may be necessary to confine the round sticker to varieties suitable to London and South of England, and use the ordinary oblong sticker for the small sizes, as is done for other destinations.

Briefly, the adoption of the sticker has resulted in the following advantages:—

1. Reduction in number of shipping marks.
2. Adoption of a universal label.
3. Intelligent marketing according to variety and size.
4. In pool districts it enables the fruit to be accounted for according to size.
5. Has given most satisfactory results in sorting of fruit to destination when assembling for overseas shipment.

The satisfactory sorting, although mentioned last, is by no means the least important. Sorting to destination is an important but troublesome task, involving much manual labour and close supervision. At one time sorting was carried out according to shipping mark, but this meant sorting according to an intricate numeral code, and did not give satisfaction equal to that which has been experienced since sorting according to sticker has been in vogue. The following list will give an idea of the amount of sorting consequent on present efforts towards intelligent transportation and marketing. Export fruit is sorted to stacks as follows:—

1. Apples for United Kingdom, not including Cox's Orange Pippin or small sizes.
2. Small size apples for United Kingdom.
3. Cox's Orange Pippin for special United Kingdom markets.
4. Apples for Southampton Cool Store.
5. United Kingdom experimental apples for special report.
6. Pears for United Kingdom.
7. Pears for Southampton Cool Store.
8. United Kingdom experimental pears for special report.
9. Forward apple sales to Rotterdam.
10. Forward apple sales to Hamburg.
11. Forward apple sales to Sweden.
12. Special Dunn's pool for Continent of Europe.
13. Apples on consignment to Continent of Europe.
14. Continental experimental apples for special report.
15. Forward pear sales to Sweden.
16. Pears on consignment to Continent of Europe.
17. Apples on consignment to South America.
18. Special apple consignments to Rio de Janeiro.
19. South American experimental apples for special report.
20. Pears on consignment to South America.
21. Forward apple sales to Canada, sorted according to buyer.
22. Forward pear sales to Canada, sorted according to buyer.

Many growers have condemned the sticker system because of the sorting involved. The sticker is not the *cause* of the sorting, but is the *means* whereby the sorting is greatly facilitated.

The outstanding disadvantage of the system is the trouble and labour involved in affixing the sticker to the case. This is a real disadvantage, which, if possible, should be eliminated or curtailed. The benefits of the sticker system are very real. Nevertheless, every effort should be made to remove the disadvantage mentioned. Any system which will do this will be of benefit, but it will be of still greater benefit if it reduces the present cost of preparing for market.

AN OPPORTUNITY FOR GROWERS.

It is hoped that many growers will give thought to this competition and will not hesitate to put forward ideas. While it is desired that suggestions should embrace all aspects connected with shipping marks and special destination, and be capable of extension to probable future requirements, growers should not hesitate to forward suggestions which deal with only one phase of the problem. Improvement in one phase may lead to other extensive improvements.

CONDITIONS OF COMPETITION.

1. The competition is open to all.
2. All entries to be written on plain paper, one side only, and must not bear signature or other means of identification. The competitor's name and address should be written on a *separate slip of paper* and enclosed with the entry.
3. After closing of competition entries will be opened by the Editor, who will allot a number to each entry, a corresponding number being attached to the competitor's name and address, which he will retain until the judges have decided the competition.
4. All schemes submitted to become the property of the Board, which reserves the right to use any or part or the whole of any scheme.
5. The Board or a sub-committee of the Board will act as adjudicators, and its decision will be binding and final.
6. A first prize of £2/2/- will be awarded to the scheme submitted having, in the judge's opinion, most practical merit.

   A second prize of £1/1/- will be awarded to the next best scheme.
7. Entries will close on 30th. September, 1930.
8. All entries to be addressed

The Editor, Orchardist of N.Z.,"
Box 882, Wellington,
and endorsed "Competition."

At the next meeting of the Fruit-export Control Board an important report will be submitted from the Cool Store Committee (Messrs. Grainger, Sutherland and Apsey) on direct loading at Nelson. This has already been submitted to the Nelson Advisory Board to assist them in connection with the plans for improvement of harbour facilities at Port Nelson.

OBITUARY.

Readers will join in expressing sympathy with the President of The Federation, Mr. T. C. Brash, on the death of his mother at the age of 80 years. The late Mrs. Brash was born in Dunedin, her parents being among the early settlers of Otago who came out in the Philip Lang in 1848. She was a sister of Mr. David Cuddie, formerly Dairy Commissioner for New Zealand, who retired some years ago. Mrs. Brash was residing with her daughter, Mrs. Linton, at Dalefield, Wairarapa, when the end came. She leaves a family of five sons and one daughter.

Mr. J. H. Parker, Nelson Branch Manager of The Federation, suffered a bereavement on August 24th., when his father, Mr. N. Parker, died at the residence of his daughter, Mrs. Gavin Watson, of Lower Riccarton. The late Mr. Parker was a retired railway officer, and he was 65 years of age. Mr. J. H. Parker was in Christchurch on leave at the time of his father's death, and we express our deepest sympathy to him and his mother in their sad loss.

FRUIT-EXPORT CONTROL BOARD.

Continental Sales Negotiation.

A meeting of the Fruit-export Control Board was held in Wellington on August 8th., Mr. A. M. Robertson presiding over a full attendance.

Nelson exporters raised the question of exchange, and the Board decided that this would not be allocated to growers on a case basis, but that it would be paid according to the amount of money remitted on each grower's behalf from London.

Direct loading at Nelson was again under consideration and will be further discussed on the return of Mr. Brown, who is expected to arrive about October 28th.

The Board has made a donation of £1,250 towards fruit research, and the result has been the establishment of an experimental orchard in Nelson district.

Several export problems were considered, including the use of corrugated strawboard, pear packages, and grades and sizes. A further meeting will be held on September 17th. to formulate recommendations on these and other subjects and circulate them to Associations in time to secure discussion at the provincial export conferences.

Efforts are being made by the Board to place 200,000 cases of apples and 20,000 cases of pears on forward sale to the Continent next season, but the negotiations are not completed.

A proposal for a competition to secure suggestions for improvement on the sticker system was approved.

You have not fulfilled every duty, unless that duty of being pleasant.—Charles Buxton.

THE EAST MALLING RESEARCH STATION

A NEW ZEALANDER'S IMPRESSIONS.

By H. E. Napier.

During the past few years scientific research in connection with the fruit industry has been the subject of many discussions and meetings of growers in New Zealand. The 1929 Dominion Conference, and the Export Conference some few months later, gave considerable time to discussing ways and means of furthering scientific research within the Dominion. At the present time I believe that the Government is still considering the grant of a subsidy, in addition to the grant already made by the Empire Marketing Board, for the purpose of purchasing and carrying on an experimental orchard in New Zealand. The writer has no hesitation in saying that if those responsible in the Government had the opportunity of visiting the East Malling Research Station, in Kent, they would immediately vote the necessary money to carry on work of a similar nature in New Zealand.

The work being done at East Malling is of very great value to New Zealand growers, but it would be of much greater value if it were carried on in New Zealand itself, owing to the fact that climatic and soil conditions may give a totally different result in England to what would be given under New Zealand conditions. Those responsible for the East Malling work have given a wonderful foundation for any similar experiments which may be carried out in New Zealand.

Mr. Brown (Chairman of the Fruit-export Control Board) and the writer visited the East Malling Station recently and were conducted over parts of it by Mr. Hatton, the very enthusiastic Director in Charge. It would be impossible, in one day, to more than touch the fringe of the experiments which are being carried out. Just here it might be well to say that the East Malling Station started with an area of 20 acres, which, with assistance from the Empire Marketing Board, the Department of Agriculture, and the co-operation of fruitgrowers in England, has now been increased to 120 acres, practically the whole of which is devoted to different experimental work. There is in the course of completion a large building, which has been erected by the Empire Marketing Board, and this will provide accommodation for the new Imperial Bureau and some additional laboratory space for the research workers and their technical assistants, of whom there are 30 at this station.

East Malling has grown from a very small thing to a station which is recognised as one of the most advanced in fruit research.

A NEED IN NEW ZEALAND.

New Zealand urgently requires something of a similar nature. This statement is made advisedly. When one has the opportunity of seeing what has been done on the root stock question and the results which are being secured, it makes one wonder whether our system in New Zealand of having the bulk of our trees on Northern Spy stock has not been a very doubtful business.

The first experiment which we were shown by Mr. Hatton was in relation to root stocks. Trees of a number of varieties upon a range of standardised root stocks, giving small, intermediate and large trees of different potentialities for early cropping, etc., are to be seen. Amongst these stocks is our Northern Spy. In past issues of *The Orchardist,* through the courtesy of the Hon. W. H. Triggs, a considerable amount of interesting information has been given on this point. The writer was very much impressed by Mr. Trigg's article, which he read before leaving New Zealand, but he must admit that it was only after seeing the experiments personally that he realised what valuable information was being made available from these experiments. Northern Spy stock, under East Malling conditions, has been practically a failure, especially when compared with other vegetatively raised stock of the vigorous and semi-dwarf character. It would be no exaggeration to say that the trees on the vigorous layered stock are several times as large as those on the Northern Spy, and not only are they larger, but the growth and foliage are more healthy.

There is one astounding thing about these experiments—that the stocks are so true to type that there is only slight variation between groups of trees on any particular stock, and such variation is, no doubt, caused by differences in soil and other local conditions. The writer was so impressed with the differences in these trees that he would have said, after viewing the experiment, that Northern Spy stocks are a failure, but then (as Mr. Hatton explained) the vigorous layered stocks, selected for English conditions, might react in a different way in New Zealand, and it is not claimed that they are immune to woolly aphis. However, if such is a highly desirable quality, a range of root stocks can and are being bred at East Malling with this character of immunity. In any case the general principle is applicable to a wide series of conditions. The behaviour—good or bad—of the tree can be largely and irrevocably

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determined by the root stock, and no single root stock has proved the best for all varieties, purposes and soils. By a right combination of stock and scion one can build up the optimum tree for any given set of conditions. For instance, there are points other than vigour to be taken into account. Up to the present, the trees on the most vigorous stock have not in many cases borne a full crop of fruit, although they were showing good promise at the time we visited the station. On the other hand the trees on the Northern Spy stock, although partially dwarfed, have borne no crop worth speaking of in the past few years, but those on intermediate stocks had already yielded well for some years past. Later on Mr. Brown and I hope to be able to pay another visit to East Malling and see for ourselves the difference in the trees when the fruit is nearer to maturity, as it will then be possible to make a fairly correct estimate as to the return possible on the yield per tree.

I should like to add that this experiment is not restricted to a few trees. It has been carried out with many varieties, and units of 12 to 20 trees of each variety have been worked on to the different stocks and distributed over the ground. Other experiments in connection with root stocks have also been conducted by having an intermediate between the stock and the ultimate scion. In other words, a variety such as the vigorous Bramley seedling may first have been worked on the stock and then another variety, such as Cox's Orange Pippin worked on to that. The idea of course is to see whether the robustness of the one can be passed on to the other. The results are often exactly the opposite to what one would expect, and this experiment, if it does nothing else, goes to prove the need of scientific knowledge on the question of the varieties to be grafted when it is necessary for any re-working to be done.

There were many other matters of interest pointed out by Mr. Hatton, but it was most difficult to absorb these in such a way that one could write anything definite about them. This will probably be possible after another visit.

MANURIAL TREATMENT.

The next experiment which impressed Mr. Brown and myself very forcibly was one in connection with manurial treatment. The block upon which this experiment was tried was first devoted to a pruning experiment, but many of the trees began to manifest symptoms of severe leaf scorch and became stunted and unprofitable, though highly fed with nitrogenous fertilisers. The experiment then developed into a test to determine the value of potash as a manure in the field to control this trouble. Mr. Wallace, of the Long Ashton Station, had shown, in pot culture work, that leaf scorch was an indication of potash deficiency.

It should be stated that the orchard is under clean cultivation, and, except for the fact that the trees are planted very much closer than we should plant them in New Zealand, the general conditions appear more or less the same. One-half of the orchard has not had any potash for four years, but it has received the same dressing in other manures as the other part of the orchard. Mr. Hatton took us through the top half and then to the half-way mark, where we were able to get a general view of the trees in the two blocks. The difference was astounding. In the top half the foliage had a slightly yellow appearance and the leaves were small and sickly, and new growth was very poor. In the lower half, where potash had been applied, the trees had a full, green foliage. The growth was especially good, and the trees generally had a perfectly healthy appearance. Mr. Hatton explained that these trees were on pure stock, and for all practical purposes each block had, with the exception of the potash dressings, the same treatment and was on practically similar soil. He further explained that a manurial experiment in the field, unless carried out on stock which could be guaranteed to be the same, was likely to be of little or no value, since it has been demonstrated at East Malling that the same variety upon different roots responds differently to the same manurial treatment. This, to us, afforded a possible explanation of a reason why, in an orchard, some trees often do not respond to manurial treatment at all. This, again, emphasises the need of a proper experimental orchard in New Zealand, with guaranteed stocks, so that some reliable knowledge could be obtained on the important question of manure values. One very interesting point in connection with these two blocks was that the Cox's Orange Pippin in the potash starved block was showing signs of what the writer would have immediately called spray injury or scorch, whilst within 28 feet the potash fed trees were full of vigour and fruit.

In New Zealand we realise that Cox's Orange Pippins are a tender variety and are liable to scorch where other varieties will escape. The astounding thing, however, was that the Cox's Orange Pippins in the lower block showed absolutely no scorch injury whatsoever, and Mr. Hatton informed us that the trees had had exactly the same treatment, were sprayed at the same time, and the scorch only developed on the block which had not received the potash. He states that the result has been most interesting to their scientific worker engaged on this experiment, as it more or less confirms the opinion that the health of the tree, especially in a variety such as Cox's Orange Pippin, is a factor to be reckoned with in the question of spray injury. It is quite possible that the same thing is applying in New Zealand; and another point of interest which Mr. Hatton mentioned was that trees did not show any great benefit from potash in the first and, possibly, the second year, which goes to prove the contention of some people that before potash is of any value the soil must receive sufficient to give it proper

balance. It was emphasised that the same effects cannot be expected under all conditions. On the other hand, field trials properly planned and conducted for a period can alone elucidate such deficiencies.

The above observations are those of one who is not very enlightened on scientific work, and are written from the point of view of a layman. There are, possibly, many little technical points which would require consideration before any definite plan could be laid down for the conduct of manurial programmes, but the general results are so striking that both Mr. Brown and I felt that growers in New Zealand should have some idea of what was possible under properly conducted scientific experiments.

We both agreed, when discussing the matter on the return to London, that if it were possible for New Zealand growers to see these experiments for themselves, there would be an immediate agitation to induce the Government in New Zealand to push on with the scientific programme which both the Department of Agriculture and the Scientific and Industrial Research Department, together with the Cawthron Institute, are endeavouring to bring into existence.

ENTERPRISE AND PROGRESS.

Nelson Growers Use Machinery.

A noticeable feature of the year's operations in the orchards of the Nelson province, especially in the central district (writes our Nelson correspondent) is the advent of many tractors and the installation of stationary pumping plants for spraying. With these up-to-date appliances spraying and cultivation should show a marked improvement in the quality and quantity of the future crops. It demonstrates the enterprise of the Nelson orchardists, and augurs well for the industry in these parts.

It is significant that over 20 of these spraying outfits were bought from The Federation. To this extent are the growers here building up their own organisation, which, as it grows in strength financially, will render still greater service to them in the future.

LECTURE ON COOL STORAGE.

Mr. Sutherland, the cool store expert attached to the Horticultural Division, recently delivered a lecture at Mapua on the cool storage of fruit. He dealt with the subject in just such a way as enabled the growers to get from it useful information that would enable them to form an intelligent judgment on questions so frequently cropping up in connection with this branch of their industry. It was a valuable contribution to the general knowledge of the fruit exporter, and was much appreciated by the growers of the district. At the conclusion of the lecture advantage was taken by those present to express the opinion that by the addition of a cool store expert to the staff of the Department of Horticulture, the Government had given the industry a good push forward.—Nelson correspondent.

Is it not the first duty of those who are happy to tell their gladness to others? All men can learn to be happy and the teaching of it is easy.—Maeterlinck.

THE CONFERENCE DINNER.

The annual dinner of The New Zealand Fruitgrowers' Federation Conference was held on Thursday, July 3rd. Mr. T. C. Brash (President) occupied the chair.

Replying to the toast of "Parliament," Colonel T. W. McDonald (Wairarapa) assured the growers that he was greatly interested in the fruit industry in New Zealand. He hoped that duty would be placed on imported fruit from Australia at a time when those imports were most inopportune.

Mr. G. C. Black (Motueka) said he appreciated the opportunity of being present. He congratulated the growers on their successful season; its success was due to their work. The growers realised how science had helped their industry, and he hoped that other industries would follow the example. He trusted that more would be done to place New Zealand fruit abroad, and to give to New Zealand people the best of edibles.

Mr. H. M. Campbell (Hawke's Bay), in reference to the remarks of Colonel McDonald in relation to imports, said that it was a case of "save the Empire." America was allowed to send almost anything she liked into New Zealand. How much fruit did New Zealand send to America? New Zealand depended on England to buy every apple exported. (Hear, hear.) In return, instead of sending the money back to England, it was passed over to America. The day had come when, with the assistance of primary producers, a stop had to be put to that. He asked growers to see at the next General Elections that their representatives were pledged to assist the British Empire.

In reply to the toast of the "Agricultural Department," Mr. A. H. Cockayne, Assistant Director-General, referred to the great strides made by the industry since 1904, when he entered the Department's service. In 1904 orchards were "game preserves" for pests, and had it not been for scientific methods fruit growing could not have attained a profitable basis. The Department had always had the welfare of the fruit industry at heart and had done what it could. He stressed the importance of the fruit industry from the national point of view. He referred to the fact that an industry such as the fruit industry, which had a large labour requirement per acre, must become more important as the years went by. Better methods would result in large increases in production with a consequent considerable amount of extra labour per acre. The key to better management was organised research in regard to soil, tree, and transport management. He was glad to say that arrangements for carrying out research were well under way.

Mr. W. T. Goodwin, Assistant Director of Horticulture, also replied.

Mr. J. W. McEwan, Chairman of the Wellington Harbour Board, in replying to the toast of the "Harbour Board," assured the growers that the Wellington Harbour Board had done its best to help the industry.

Captain A. V. Hale Monro said that as far as the Traffic Department of the Harbour Board was concerned, it was the best season they had had.

Other toasts were the "Shipping Companies," replied to by Mr. J. H. C. Bond (New Zealand Shipping Company); "The Railways," replied to by Mr. J. Brown; "The Fruitbrokers," replied to by Mr. A. Jacobs; and "The Retailers," replied to by Mr. J. Ranson.

A pinus insignis case, of a greatly improved type, has this season been put on the Nelson market, writes our correspondent. This case (locally produced) is a vast improvement on anything of the kind previously submitted to the growers of this province. The enterprise of the firm responsible deserves, and will doubtless receive the support of the growers. It may take a season to break down the prejudice of the past, due to wretched service, but given a really good dry case at a price possible in view of the fall in oversea prices of fruit, and the growers will fill all their requirements with the local article.

FIVE YEARS' PROGRESS IN ORCHARD DISEASES CONTROL

A paper read at the Dominion Conference of the Federation by Mr. G. H. Cunningham, B.Sc., Mycologist at the Dept. of Agriculture Plant Research Station, Palmerston North. This valuable survey brings up to date the standard work on Fungous Diseases of Fruit Trees in New Zealand, written in 1925 by Mr. Cunningham, and published by The N.Z. Fruitgrowers' Federation Ltd.

On being requested by the Executive of The Fruitgrowers' Federation to address this Conference, I decided to outline the progress of diseases control work in horticulture during the past five years; this period being chosen, since at that time the Federation published a book on the fruit-tree diseases of the Dominion, in which existing knowledge was brought together.

Horticultural mycology, especially in a country such as New Zealand, possesses many peculiar problems. Firstly because the orchard is more in the nature of a permanent stand, so that practices such as seed treatment, use of resistant varieties, crop rotations and fallowing (aids in fighting field crops diseases) cannot be employed, consequently, in dealing with diseases of fruit-trees we have to concentrate on two phases of control, hygiene and spraying. Secondly, because we are so far from the world's markets that our products have to be carried under abnormal conditions and for considerable periods of time, we have to consider diseases (produced both by fungi and storage conditions) which occur in transit and subsequently.

Therefore it is well to consider the problem under the following three headings:—

(1) Orchard Hygiene.
(2) Sprays, Spraying and Sprayers.
(4) Storage and Transit Problems.

ORCHARD HYGIENE.

This term covers not only cleanliness in orchard and store, but also the general health of the trees themselves. Recent investigations into the life-histories of many diseases have made available information which enables considerable improvements to be made in the control of certain diseases. Thus in the control of brown-rot (*Sclerotinia cinerea*) Mr. Rice has shown in five years' experiments at Auckland that removal of mummied fruits and cankered twigs from the trees, and burying of mummies lying on the surface of the ground, materially aided control. Recent work in England on powdery mildew (*Podosphaera Leucotricha*) has shown that this fungus is perpetuated by means of perennating mycleium in the blossom buds. The peculiar structure of the blossom bud of the apple, which includes leaves, permits of this since the fungus persists on these leaves and as soon as they unfold in the spring sporulates freely upon their surfaces, to commence a new cycle of infection. This shows that in mildew control, removal of infected material is impracticable (since flower buds carry infection), and that the first spray should be applied, in districts where mildew is troublesome, at or preceding the pink stage.

IMPORTANCE OF STOCKS.

That stocks play an important part in the vigour, and consequently the health of the tree has been demonstrated in England at East Malling. By selecting the stock to suit local requirements large or small trees can be produced at will, and trees can be made to fruit within a season or two after planting, or not for 8 or 10 years. Close or wide spacing can be adopted accordingly. In other words, this work has demonstrated that by a choice of root stock the orchardist can produce dwarf or giant trees at will—the larger the trees the longer it takes to produce fruit, and *vice versa*. And a grower in England has his choice of stock to suit his type of soil; contrast this with the New Zealand conditions where, as far as I am aware, all commercial trees are worked on Northern Spy stocks. Thus in the acid soils of Auckland and the rich soils of Hastings, the poor clays of the Moutere Hills in Nelson and the alkaline soils of Central Otago, the grower is limited to one and the same stock. There is little doubt but that most of the physiological diseases so troublesome on the Moutere Hills to-day are induced largely by unsuitability of the stock used; and this certainly applies in Central Otago, for I believe I am correct in saying that the English workers have demonstrated the unsuitability of Spy stock for alkaline soils.

In the northern parts of the Dominion, where occur our commercial citrus orchards, heavy losses used to be suffered through the one-time practice of propagating lemon trees from slips. To-day root rots are comparatively rare owing to the general practice of budding certain seedling stocks. And in California this practice is coming into use as a means of combating root troubles.

SPRAYS, SPRAYING AND SPRAYERS.

Where the host is of a permanent type, as in commercial orchards, such practices as the use of varieties, more suitable types, rotations, etc., cannot be used without considerable delay and economic loss. Improved varieties and more suitable stocks can be introduced gradually in the establishment of future orchards, but our immediate requirements in disease control lie in improvement of sprays and the technique of applications. It helps, too, when a knowledge of the behaviour of the organism is obtained, for then it can be determined with greater accuracy just when and what kind of spray to apply. The two common fungicides in use to-day are copper and sulphur, for these form the base of most of our commercial sprays. Additionally, arsenic is used as a poison for chewing insects, nicotine or oil as a contact insecticide for sucking insects. Copper is one of the most effective fungicides known, save for mildews, but cannot be used alone, partly because of its scorching effect on fruit and foliage, and partly because its solubility is such that it will not remain on foliage or fruit as a protective cover for more than a short time. Consequently, it is combined with lime (as Bordeaux) or soda (as Burgundy), so that a chemical compound (or compounds) is formed.

In New Zealand, Bordeaux has been found to scorch severely if used as a seasonal spray on other than pears; yet elsewhere, as in Britain, Europe and North America, its use throughout the season is general. For the control of black-spot of apples (*Venturia inaequalis*) and pears (*V. pyrina*) it is preferable to any other spray in commercial use, yet in this country has been superceded almost entirely by lime sulphur sprays; partly because the latter has less detrimental effect to fruit or foliage (though as I will show this is more apparent than real), and partly because they also possess insecticidal properties. To-day the universal practice to reduce the cost of spraying is by combining fungicides (as lime-sulphur) with insecticides (as lead arsenate and nicotine sulphate), and this has led to a general belief that scorching of foliage and russetting of fruits is increased by this practice. Chemists and mycologists in Britain, Europe and North America have been steadily experimenting with a view to improving the toxicity of sprays towards fungi, of reducing their damaging effects on fruits and foliage, and of prolonging their period of activity so as to reduce the number of applications, and thereby lessen spray costs. From this recent work some interesting particulars are forthcoming, particulars which show the possibilities in this field of investigation.

(*a*) *Bordeaux Mixture.*

This is prepared by mixing a solution of bluestone (copper sulphate) and quicklime (calcic oxide). Two methods are practised; one to dilute the bluestone with water and to add to

BIGGER CROPS BETTER FRUIT

by manuring with

I.C.I. SULPHATE OF AMMONIA

Recommendations for different crops :

PEACHES—For Peaches apply 1½ lbs. Sulphate of Ammonia per tree in early September, and 1½ lbs. Sulphate of Ammonia middle November.

"The results of the manurial experiments point clearly to the great importance of nitrogeneous manures for Peach orchards, and indicate that a dressing of at least 3 lbs. per tree for orchards in full bearing is required for optimum fruit production." (Extract from Bulletin issued recently by Cawthron Institute, Nelson.)

APRICOTS —As for Peaches.
NECTARINES —As for Peaches.
APPLES —Apply 2 lbs. Sulphate of Ammonia per tree 3 weeks before blossoming. 1 to 2 lbs. after fruit set. (DELICIOUS variety can do with 50% increase on above quantities).
PEARS —As for Apples.
CHERRIES —1½ lbs. Sulphate of Ammonia per tree before blossoming. 1 lb. after fruit set.
PLUMS —1 lb. Sulphate of Ammonia per tree before blossoming. 1 lb. Sulphate of Ammonia per tree after fruit set.
RASPBERRIES —1½ cwt. per acre in early spring. 1 cwt. after fruit begins to form.
CITRUS FRUITS —LEMONS and ORANGES:—2 to 3 lbs. Sulphate of Ammonia per tree in spring. 2 to 3 lbs. Sulphate of Ammonia per tree in autumn.
STRAWBERRIES—1 cwt. per acre when first fruit forms. Repeat twice at intervals of fortnight.
CURRANTS —2 to 4 ozs. per bush in spring.
GOOSEBERRIES —2 to 4 ozs. per bush in spring.
GRAPES —1½cwt. per acre in spring. 1 cwt. per acre after fruit set.
HOPS —1½ cwt. Sulphate of Ammonia end October. 1½ cwt. Sulphate of Ammonia end November. 1½ cwt. Sulphate of Ammonia end December.

NOTE.—The quantities specified above refer to average aged trees. It is highly desirable that the quantity of Sulphate of Ammonia used be increased according to the age and condition of the trees. A run-down orchard naturally requires more intensive fertilising.

APPLY Sulphate of Ammonia at range of 2 to 5 feet around tree—work lightly into soil.

Phosphates and Potash Manures should be applied in the winter months.

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this milk of lime (prepared by slacking quicklime in water); the other to dilute the milk of lime with water and add a concentrated solution of bluestone. Either is apparently equally effective, but the value of the mix as a fungicide and its period of effectiveness on the tree, as well as its liability to scorch and russett, depend on the proportions and purity of both lime and bluestone. Commercial bluestone of any reputable brand is to-day above reproach; but much of the lime used is of poor quality, containing considerable amounts of inert matter (as stones and earth) and magnesium oxide. Recent investigations in England has shown that the CaO/MgO ratio directly affects the quality of the solution; for Bordeaux made with quicklime rich in CaO is strongly alkaline and bright blue in colour, whereas when much MgO is present, it is greenish and much less alkaline. Now the more alkaline the Bordeaux, the less likely is it to scorch, and the longer it remains on the tree.

This is significant, as it indicates why Bordeaux injury may be prevalent in certain districts or orchards and absent from others; and demonstrates the necessity for procuring a high-grade quicklime.

Recent investigations overseas have shown that Bordeaux prepared with commercial hydrated lime is equally as effective as that prepared with quick-lime. Consequently the use of this is advisable, as it ensures that the lime is of a standard quality, facilitates the preparation of the spray, and permits of the use of a more exact formula, since it has been found that the best suspensions are obtained when hydrated lime is used in a formula of 2:3½:50 (hydrated lime 2 pounds, bluestone 3½ pounds, water 50 gallons). Recent work in the United States has shown that in the control of black-spot calcium monosulphide (Ca S) has given equivalent results with Bordeaux.

(*b*) *Sulphur and Sulphur Compounds.*

As a controller of mildews, sulphur has been used as a fungicide for many years. Combined with lime in various ways it has largely replaced Bordeaux as a spray for black-spot or brown-rot. Recent work has been directed towards increasing the efficacy of sulphur, either alone or in combination with other chemicals. The value of sulphur as a fungicide is limited to its action against those fungi which grow on the surface of the leaf or fruit; and that is why it is of use against mildews, but of little value against black-spot or leaf-curl (*Taphrina deformans*). To understand this it is necessary to consider the manner in which it acts as a fungicide. Two views are held to-day, (1) That sulphur gives off minute solid particles which, under certain conditions are produced from the parent mass continuously. Its fungicidial action depends entirely on the actual contact of the sulphur particle with the fungus, since sulphur is not toxic until the votalised sulphur is recondensed on the organism; (2) that the active agent is a volatile substance gaseous in character, being neither sulphur dioxide (S_2) nor hydrogen sulphide (H_2S) but a volatile, elementary (non-particulate) sulphur.

Either belief explains why sulphur is effective only against exposed portions of fungi, why effectiveness increases with the fineness of division of the particles or with an increase in the temperature of the atmosphere. Recent work has shown that its effectiveness as a fungicide can be increased by the addition of certain oxidising agents, such as potassium permanganate or manganese dioxide.

For mildew control, precipitated sulphur has been recommended in preference to commercial sublimed sulphur, because of the fineness of its particles. But this preparation has not come into favour in the Dominion, partly because of its initial cost, and partly because of the difficulty of preparing a suspension in water, but chiefly because the few field experiments conducted have tended to show its effectiveness is no greater than that of the cheaper commercial sublimed sulphurs on the market.

We have recently attempted to ascertain why this last position has arisen. As a commencement, we made analyses of the preparations on the market sold as precipitated sulphur, and found that of all those tested, not one was genuine precipitated sulphur, but all were sublimed sulphurs to which had been added various substances, as Fuller's earth or soap powder, to facilitate mixing. This evidence tends to show that precipitated sulphur as a fungicide has not yet been tested out in the Dominion, and shows, too, that the orchardist should not buy any spray material unless its composition is plainly stated on the container.

Sulphur may be applied in either a dry or liquid form, in the latter case either water alone or some other spray being used as the vehicle of application. When used as a liquid spray, difficulty is often encountered in mixing dry sulphur with water. This may be overcome by the use of soft soap or Fuller's earth, a satisfactory mix being obtained when a 1 per cent. solution of soft soap in water is used.

Dry dusting has found little favour in New Zealand, partly because a special apparatus is required for the purpose, partly because under ordinary conditions so much of the sulphur is lost (between 89 and 94 per cent., according to United States figures) within one week of its application.

(*c*) *Lime-sulphur plus Arsenate.*

Lime-sulphur has almost superseded Bordeaux as a spray in New Zealand, partly because it can be used as a dual insecticide fungicide; partly because of its ease of preparation, but largely because of its supposed inability to damage foliage and fruit. But in recent years orchardists have often found leaf scorch to follow lime-sulphur, and there is a growing belief that this spray is largely responsible for the russetting of fruit. The recent experiments carried out by Mr. Thorp at Nelson confirm this belief, for he obtained approximately 60 per cent. russetted fruit on trees sprayed with lime-sulphur alone, about the same amount on trees sprayed with lime-sulphur plus lead arsenate, whereas unsprayed trees, or trees sprayed with lead arsenate alone, were free, or almost free from russett.

That leaf scorch is intensified by the use of the combined lime-sulphur plus lead arsenate is an opinion widely held, not only in New Zealand, but also in North America and Britain, and experiments conducted in recent years have verified this belief. From these it would appear that leaf scorch (and fruit russett) is due to liberation of free arsenic during the mixing of the spray or subsequently on the foliage. If hydrated lime is added to this combination spray, at the rate of between 5 and 10 pounds per 100 gallons of spray, scorching and russetting are eliminated. Casein, at the rate of 4 ounces per 100 gallons, has a similar effect. Recent work in America has shown that the addition of ferrous sulphate at the rate of between ½ and ¾ pound per gallon of spray produces a similar result; but this addition is not advisable late in the season, since the preparation discolours the fruit.

Recent work in Britain and North America has shown that if lead arsenate is replaced by calcium arsenate, scorching is eliminated, and the toxicity of the spray increased against such disease as black-spot; for a 1 per cent. solution of calcium arsenate was found to possess the same degree of toxicity as 4-4 50 Bordeaux. Nicotine sulphate was also found to reduce scorch when added to lime-sulphur plus lead arsenate spray.

(*d*) *Dry-mix.*

This spray has come into more or less general use in New Zealand during the past five years. The original formula recorded by Farley from New Jersey in 1923 (to which was applied the name "dry-mix" sulphur lime) contained 8 pounds of sulphur, 4 pounds hydrated lime, 8 ounces of calcium arsenate to 50 gallons of spray. In 1924 Robinson, in Oregon, modified this to form his "Oregon cold mix," the formula of which was 8 pounds sulphur, 4 pounds hydrated lime and 2 quarts of skim milk to 50 gallons. In California, dry mix has proved the most satisfactory spray for leaf-rust (*Puccinia Pruni-spinosae*) and brown-rot; and in New Zealand, at Henderson, proved to be most satisfactory in the control of brown-rot. But in Michigan it proved to be inferior to lime-sulphur solution in black-spot control.

The efficacy of this spray depends in large part on the fineness of division of the sulphur particles, and on the temperature of the region subsequent to its application.

(*e*) *Applications.*

As to the time to apply sprays, I need say little, save to point out that there is a very close correlation between the time of application and the degree of control attained. This depends

again on so many factors, such as season, locality, variety and disease, that even generalisations have only an approximate value. The best guide is results obtained by the most successful growers in a district. Recent work overseas has tended to show that improved results may sometimes be obtained by one or more late autumn applications after the fruit has been picked; thus in black-spot, leaf-rust and leaf-curl control, an application of 1-30 lime-sulphur solution at this period has in some cases resulted in a marked decrease in the percentage of disease (over trees not treated in this manner) the following spring.

(*f*) *Apparatus.*

In modern spray practice, high pressures and ready access to the orchard are necessary to success. During the past five years rapid progress has been made in the development and use of stationary plants. These have many advantages over portable outfits, the chief being the rapidity with which applications can be made, and the ability to spray on land frequently impassible to heavy portable plants. Higher pressures can be used, permitting of greater volumes of spray being applied in a shorter time, with a consequent reduction in labour costs. Many details still require investigation, one of the most important being the size of the pipe lines. Recent work in California has shown that there is a definite relation between the diameter of the piping and the end pressure delivered at the hose. Thus in 100 feet of piping with a pressure of 400 pounds and a flow of 25 gallons per minute, the following figures were obtained:—

¾"	pipe caused a loss in pressure of					78	pounds
1"	"	"	"	"	"	19	"
1¼"	"	"	"	"	"	6.4	"
1½"	"	"	"	"	"	2.6	"

STORAGE AND TRANSIT PROBLEMS.

Even when the orchardist has produced fruit free from disease his troubles are not over, since he has to place the great bulk of it upon the overseas market. And a few years ago marketing of fruit in good condition was a very real problem, as storage and transit losses were heavy, due to physiological diseases such as flesh collapse and scald, and to fungous rots. Owing largely to investigation carried out in Britain at the Cambridge Low Temperature Research Station, and in New Zealand by the Department of Agriculture and Cawthron Institute, losses due to storage troubles such as flesh collapse and scald have been gradually reduced until in 1929 season's shipments they amounted to less than 1 per cent. Recent work has shown these troubles can be practically eliminated if attention is paid by the storage engineer to the temperature-humidity relationship of the store, and by the orchardist to the time of picking and degree of maturity of the fruit.

As storage losses due to these troubles have been reduced, greater attention has been drawn to other troubles affecting fruit in store in transit, the notable examples being bitter-pit and fungous rots. The losses induced by these have sometimes attained a high percentage. Thus in a few lines shipped last season bitter-pit was present to the extent of 60 per cent., and in some cases 40 per cent. of fungous rots were noted. Much work has been conducted in England this past three or four seasons on the fungous rots developing in New Zealand fruits. From this it is evident that many factors affect wastage due to fungi, but as much of the work recorded is conflicting, and at variance with results obtained in New Zealand, a summary of the position cannot yet be given. We have in hand at the present time a comprehensive series of experiments designed to supply us with the necessary information as to the factors favouring and inhibiting these rot-producing organisms, so that we may be able to determine whether these troubles are due to faulty handling or storage of the fruit in New Zealand, or whether shipping conditions are responsible for their development.

Recent work in Australia on bitter-pit has tended to show that this disease can be largely combated by attention to the correct time of picking of susceptible varieties (which in Australia are Cox's Orange, Cleopatra, Sturmer, Dunn's and Granny Smith). This, according to Carne, can be measured accurately by placing halves of selected fruits for 30 seconds in a solution of iodine. If the fruit is at the correct stage for picking this treatment will result in the appearance of small scattered bluish spots (due to the action of the iodine on the starch) in the pulp, but not within the core line; if no colour develops the apples are over-mature; if immature, colour develops in large patches throughout the pulp. This worker claimed that the terminal fruits were the most susceptible to bitter-pit, and therefore these should be removed during thinning.

This resumé of the position indicates that many improvements are possible in New Zealand orchard practice, but as our experience has demonstrated very frequently that results obtained elsewhere do not necessarily give similar results under local conditions, all these modifications require to be tried out experimentally before they can pass into current orchard practice. I am glad to be able to inform you that we are now in the position to undertake this experimental work, since an Orchard Instructor (Mr. Dallas) is being seconded by the Director of the Horticulture Division to the Mycological Laboratory to specialise in experiments on the control of orchard diseases. He has a full programme before him, for not only has he to carry out experiments in spray practices as outlined, but has to investigate fungous rots in cool store, study the behaviour of both fungous and physiological diseases in the field, experiment with stocks, and conduct the very necessary tests of spraying materials on the market.

Collaboration with this officer on the part of the orchardist will lead to a more rapid improvement in orchard diseases' control in this Dominion.

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STRAWBOARDS

are considered essential protection for export fruit. It would be difficult to prove in pounds, shillings and pence that the use of corrugated strawboards will enhance the value of our fruit in overseas markets, but it may fairly be contended that fruit arriving in good condition, comparatively free from bruising, will be more readily saleable if it does not actually command a premium over fruit less adequately protected.

We have endeavoured to circularise all exporters, offering corrugated strawboards for the coming season's crop, but if you have not received a circular or placed your order with your Branch office, send for a circular and get your order placed. Don't depend on drawing from stock held by The Federation except for extra supplies—get your main order placed now —this in your interests as well as ours and that of other growers.

Spraying Supplies

may be obtained from any of our Branches, established in your district to better serve and supply your requirements. All standard insecticides and fungicides are obtainable, together with sprayers, hose, etc. Orders sent direct will receive careful and prompt attention. If you desire a call by one of our Representatives send a line and let us know. We will be pleased to quote for your requirements. Lower your production costs by buying all your supplies through your own organisation.

THE

New Zealand Fruitgrowers' Federation Ltd.

HEAD OFFICE: BOX 882, WELLINGTON.

BRANCHES: Box 886 Auckland — Box 322 Hastings — Box 8 Port Nelson — Box 805 Christchurch

Telegrams: "Fruitfed."

FRUIT MANURIAL EXPERIMENTS ON NELSON SOILS

By T. RIGG, assisted by O. BARTON (Cawthron Institute, Nelson).

During the past six years, a number of manurial experiments has been conducted by the Cawthron Institute on different varieties of fruit trees on several important soils of the Nelson district. In certain cases, very great response to manurial treatment has resulted. In other cases the effect of manurial treatment on yield of fruit has not been so marked, although improvement in growth and vigour of tree has resulted from the manurial treatment. Owing to the large number of requests for advice concerning the manuring of fruit trees on different types of soil the following notes are supplied by way of a review of these experiments.

1.—RASPBERRY CULTURE.

The more important raspberry centres of the Nelson district are located on fine sandy soils of the Orinoco and Motueka Valleys. These soils, as a rule, have an excellent texture and are naturally well-supplied with phosphates. In the past, blood and bone was used for many years for the manurial treatment of raspberry gardens. Owing to the high fertility of the soil, good results were obtained for many years by this manurial treatment. In recent years, however, the yields tended to drop and disease made serious inroads into the gardens. The adoption of a balanced manurial programme, in which phosphates, potash and nitrogen were all included, at once effected great improvement, both in yield and the vigour of the raspberry gardens. For several years a mixture of 3½ cwt. superphosphate, 1½ cwt. sulphate of potash, ½ cwt. dried blood, and 1 cwt. of ammonium sulphate per acre, has been used by the majority of the growers on the recommendation of the Cawthron Institute, with very excellent results.

2.—PEACH CULTURE.

Manurial experiments on peach trees have been carried out by the Cawthron Institute at both Stoke and Riwaka. The Riwaka soil is a deep alluvial fine sandy silt, well suited, by reason of its texture, for optimum results with peach trees. This soil is well supplied with phosphate. The Stoke soil is a light gravelly loam, which does not give the free root development of the Riwaka soil. The Stoke soil is of average fertility, being moderately well supplied with both phosphate and potash. In the Riwaka experiment, outstanding results were obtained by the use of nitrogenous manures, application of 3 lb. of nitrogenous manure (used in two instalments during September and the beginning of November), resulting in an increase of one bushel of fruit per tree. On this soil, phosphatic and potassic manuring appear to give at the present time comparatively small benefit.

In the Stoke experiment the value of nitrogenous manuring was again clearly seen by improved growth of the trees. A mixture of 2 lb. of superphosphate, 1 lb. of sulphate of potash, combined with an application of 3 lb. of nitrogenous manure (applied in two instalments), effected over a period of 3 years an average annual increase of 20 lb. of fruit per tree.

3.—APPLE CULTURE.

Manurial experiments on apples have been conducted by the Cawthron Institute on three important fruit soils in the Nelson district. In certain cases, the experiments have not proceeded long enough to enable any final statement to be made. In a number of cases, however, there is no doubt concerning the immense value of manurial treatment. The soils used for apple culture in the Nelson district vary greatly in natural fertility. Riwaka soils promote deep rooting of trees and are well-supplied with plant food, particularly phosphates. Moutere Hills soils are texturally well suited to the production of high quality apples, but the fertility of the soil is extremely low. Stoke soils are intermediate in fertility to the Moutere Hills and Riwaka soils.

Perhaps no better illustration of the value of manurial treatment for apple trees could be cited than the apple lands of the Moutere Hills. In those cases, where orchardists have adopted systematic manurial treatment for a period of 5 or 6 years, wonderful improvement in the vigour and development of the trees has resulted, and the yield of fruit has steadily increased. In the better orchards, yields averaging 350 to 400 bushels of fruit per acre are now being obtained, while certain varieties in particular seasons have yielded as much as 600 bushels per acre. Untreated orchards, on the other hand, have gone steadily backward.

The early experiments of the Cawthron Institute have shown definitely the great deficiencies of lime, phosphate, nitrogen and organic matter which are associated with the Moutere Hills soil. A manurial programme based on regular cover cropping with blue lupins, combined with the application of phosphatic manures and the use of lime, has been largely responsible for the splendid improvement which has been effected in these orchards. In recent years the use of nitrogenous manures in the spring has been introduced with very beneficial results.

The following data have been supplied by an orchardist located on what may be termed the better phase of Moutere Hills soil, and illustrate the wonderful improvement which has been effected in crop returns by systematic manuring. Previous to 1925 very little manuring was done. In the spring of this year a systematic programme of manuring was begun. The manurial programme consisted of a preliminary treatment with 2 tons of ground limestone per acre, followed by the application each spring of 2 cwt. superphosphate, ¾ cwt. sulphate of potash, and 1 cwt. sulphate of ammonia per acre. In January, a cover crop of blue lupins was sown, manured with 2 cwt. of superphosphate. The following yields, covering the output of his orchard of 54 acres, have been supplied by the grower:

	Bushels
1926	9,460
1928	11,738
1929	15,912
1930	19,000

The above orchard was planted in 1911 and 1912, and was 13 to 14 years old at the commencement of systematic manuring. Trees of this age should have been bearing much more heavily than was actually shown by the yields in the year 1926. Undoubtedly low fertility was an important factor in the reduced yields which were being obtained prior to the commencement of systematic manuring.

MANURIAL EXPERIMENTS ON MOUTERE HILLS SOIL.

Several experiments have been initiated by the Cawthron Institute on the Moutere Hills soil. Some experiments have been in progress 6 years, while others have been commenced more recently. Particulars of these experiments are given below, and are divided into two groups, according to the quality of soil in the orchards at the commencement of the experiments.

(A) Manurial Experiment on Jonathan.

(Poor phase of Moutere Hills soil.)

The slopes in this orchard are comparatively steep, and the soil is exceedingly poor. The experiment was begun 6 years ago, when an initial lime application was made to the treated blocks. These have received in the first 4 years of the experiment 5 cwt. of phosphatic manure, 1¼ cwt. of sulphate of potash per acre, and a cover crop has been sown three years out of four. An application of nitrogenous manure—either dried blood or ammonium sulphate—at the

Fruit Manurial Experiments on Nelson Soils.

Cawthron Inst. photo.

EXPERIMENTAL PLOTS, UPPER MOUTERE.

(Jonathan variety on Moutere Hills soil.)

Blocks C and F untreated. Blocks A, B, D, E, and G have an annual application of 4 lb. phosphate (superphosphate or bonedust), 1 lb. sulphate of potash per tree. In addition, Block A has 1 lb. ammonium sulphate, Blocks B and G have 3 lb. ammonium sulphate, Block D has 1 lb. dried blood and Block E has 3 lb. dried blood per tree.

rate of 1 lb. per tree, was made in the spring. During the last 2 years manurial treatment with artificial fertilisers has consisted of an application of 4 lb. of phosphatic manure and 1 lb. of sulphate of potash per tree, broadcast over the ground before ploughing in the cover crop. In addition, 3 lb. of nitrogenous manure—either dried blood or ammonium sulphate—has been used around the trees about the third week in September. Yields of fruit have been carefully recorded for the last 2 years, with the following results:

Manured blocks averaged 300 bushels per acre per annum.

Unmanured blocks averaged 187 bushels per acre per annum.

Difference due to manurial treatment=113 bushels per acre per annum.

In these experiments somewhat similar results have been obtained with both ammonium sulphate and dried blood. On certain blocks, a 1 lb. application of nitrogenous manure was tested against a 3 lb. application. Much better development of leader and foliage has taken place with the larger application of nitrogenous manure, and the yield of fruit, particularly on the steep slopes where the soil is poorest, has been increased. On the lower slopes, where the soil was deeper, the use of the larger application in increasing fruit yield has not shown to such great advantage.

(B) Manurial Experiment on Cox's Orange Pippin.

(Poor phase of Moutere Hills soil.)

Very remarkable improvement in crop yield, accompanied by increased growth and vigor of the tree, has resulted from liberal nitrogenous manuring in the case of the Cox's Orange variety located on a rather poor slope of typical Moutere Hills land. A base treatment of 3 cwt. of superphosphate and 1 cwt. of sulphate of potash per acre was given to all blocks. Certain blocks received, in addition, dried blood at the rate of 5 lb. per tree. Other blocks received dried blood at the rate of only 1 lb. per tree. In the case of the heavy application of dried blood, 3 lb. was applied during the third week in September, the remaining 2 lb. being applied in the beginning of November. A cover crop of blue lupins was sown in January. The experiment has been continued for 2 complete years, and during the last season records of yield were taken. Excellent foliage and growth development was associated with the liberal nitrogenous manuring. The blocks with the light application of nitrogenous manure looked starved and showed very little improvement. During the 1930 season, a yield of 130 lb. per tree was obtained with the large application of nitrogenous manure, while the blocks with the small application of nitrogenous manure averaged only 80 lb. per tree.

JONATHAN VARIETY ON STOKE GRAVELLY LOAM.

Photograph illustrates the effect of deep cultivation and manuring with 3 cwt. superphosphate and 1¼ cwt. sulphate of potash per acre, plus spring application of 2 lb. ammonium sulphate per tree.

Last season, trees on the experimental plots averaged over 200 lb. of fruit per tree. *Cawthron Inst. photo.*

(C) Manurial Experiment on Cox's Orange Pippin.
(Better phase of Moutere Hills soil.)

This experiment has been in progress for 2 years, on what may be termed the better phase of Moutere Hills soil. The soil was comparatively deep, and good development of tree had taken place. The same experiment as outlined in (B) has been in progress for 2 years. In this case heavier growth and more vigorous foliage development resulted from the large dressing of dried blood. Very good growth, however, was obtained with the light application of dried blood, and the fruit yields from the two blocks showed little variation. If anything, the yield with the small application was higher than that with the heavy application of dried blood. Colour of fruit was much better with the small application, the fruit on the heavily treated blocks being of somewhat inferior quality.

(D) Manurial Experiment on Statesman and Delicious.
(Improved Moutere Hills soil.)

During the last two years an experiment to ascertain the effect of rather heavy applications of nitrogenous manure on the yield and growth characteristics of trees of the Statesman and Delicious varieties, has been conducted on an improved Moutere Hills orchard. This orchard has received liberal manurial treatment for a number of years, and has given wonderful results, both from the point of view of development of trees and crop yields. The experiment consisted in the application of dried blood at the rates of 1 lb. per tree on certain blocks and of 5 or 6 lb. per tree, divided in two instalments, on other blocks. Although no records of yield are available for these experiments, yet there did not appear to be any advantage in the case of the Statesman variety on the orchard in question, in increasing the application of nitrogenous manure beyond 1 lb. per tree. In the case of the Delicious variety, a very distinct improvement in vigour of the tree, foliage development and quality of the fruit, resulted on the blocks treated with 5 lb. of dried blood per tree. The adjoining blocks treated only at the rate of 1 lb. per tree were lacking in foliage development, the fruit was dull, and the trees were badly affected with red spider and red mite. The trees with the heavy application of dried blood were remarkably free from infestation.

FRUIT EXPERIMENTS ON STOKE SOILS.

Experiments on apple trees have been in progress for some years on two soils at Stoke.

(A) Manurial Experiment on Wakatu Loam.

This soil is a somewhat heavy loam well supplied with organic matter and nitrogen, but somewhat deficient in phosphate. Experiments on a limited number of trees have been in progress for nine years, and records of yield have been maintained for the whole period of the experiment. The variety under test has been the Dougherty. Increase in fruit yield as the result of various manurial applications in this experiment has been comparatively small. Trees manured regularly with superphosphate and sulphate of potash have given a total average yield per tree for the

EXPERIMENTAL PLOTS, UPPER MOUTERE. *Cawthron Inst. photo.*
(Jonathan variety on poor phase Moutere Hills soil.)
Right: Untreated. Left: Treated with 4 lb. phosphate, 1 lb. sulphate of potash, and 3 lb. dried blood per tree.

nine years of 1,181 lb. A complete manure containing 2 lb. of ammonium sulphate per tree, in addition to superphosphate and sulphate of potash, gave a total average yield of 1,205 lb. per tree. The untreated trees have given a total average yield of 1,037 lb. per tree. A very noticeable feature of the experiment at the present time is, however, the very large amount of die-back which is associated with the untreated rows. The treated rows still continue to make growth and are comparatively free from die-back. It is quite clear that the untreated trees now require somewhat drastic treatment if they are to continue in heavy bearing very much longer. Somewhat similar results have been obtained with the Sturmer variety on the same soil.

(B) Manurial Experiment on the Stoke gravelly loam.

(1) Experiment with Jonathan.

During the last two years an experiment to determine the value of nitrogenous manuring has been conducted in an orchard located on a typical area of the Stoke gravelly loam, which is extensively used for apple culture. Prior to the commencement of this experiment, the Jonathan trees, which were well grown, were decidedly on the down-grade. The owner, however, introduced a system of deep cultivation and a good manurial programme. This programme consister of the application of 3 cwt. of super-phosphate and 1¼ cwt. of sulphate of potash, which were broadcast over the cover crop before ploughing in. The cover crop was sown during January in each year, and a very fine crop was obtained on each occasion. With the exception of certain blocks, 2 lb. of ammonium sulphate per tree was used as a spring treatment about the third week in September. In both years excellent crops were obtained over the whole of the orchard, indicating that the manurial treatment, combined with deeper cultivation, had been very effective in bringing the orchard into a high state of productivity. Moreover, leader growth and foliage development were satisfactory, showing that high fruit yield was not being obtained at the expense of future crops. A manurial experiment conducted by the Cawthron Institute in this orchard consisted of a test of 2 lb. of ammonium sulphate per tree against the use of a larger application at the rate of 6 lb. per tree, which was applied in two instalments. In both cases superphosphate and sulphate of potash were applied at the rates previously mentioned for general orchard use. Rather better growth was obtained on the blocks treated with the 6 lb. application of ammonium sulphate, but the fruit yield was little affected by the heavier treatment. If anything, a slightly heavier crop was obtained from the trees with the small application than was the case with the large application of ammonium sulphate. Records of yield for two years showed an average annual yield of 189 lb. per tree in the case of the light application of ammonium sulphate, and of 180 lb. per tree in the case of the heavy application.

NOTE.—It is doubtful whether the difference in yield is significant.

(2) Experiment with Sturmer.

A somewhat similar experiment with ammonium sulphate was tried on trees of the Sturmer variety, using as before a light application of 1 lb. of ammonium sulphate per tree against a heavy application of 5 lb. per tree. In both cases superphosphate at the rate of 3 cwt. per acre, and sulphate of potash, at the rate of 1¼ cwt. per acre, were applied previous to nitrogenous manuring.

Little advantage could be detected between the blocks receiving the light or the heavy applications of ammonium sulphate. The yields were remarkably good in both cases, being slightly in favour of the light dressing, an average annual yield of 179 lb. per tree being obtained with the 1 lb. application, and 171 lb. per tree with the 5 lb. application.

A summary of the above results appeared in our August issue, and readers should attach it to this article for ready reference.

FRUIT SHIPMENTS.

Problems in Transport.

Reference to some of the problems to be faced in the shipment of fruit was made by Mr. R. Sutherland, cool storage officer, Department of Agriculture, in an address to the Fruitgrowers' Conference.

He referred to the fact that in 1908 the total number of cases exported was 1236, and the total for 1930 was estimated at 1,250,000, and said it was a unique example of a great trade developing in a comparatively short time as a direct result of refrigeration. The enormous increase had entailed big changes. Whereas in the earlier stages of fruit export the individual shipments amounted to only a few hundred cases which could be placed in a small locker or in a suitable position on any vessel carrying refrigerated products, the larger shipments to-day necessitated big holds which increased the risks proportionately, the ship's refrigerating plant being taxed to its capacity. That, in many cases, might mean that the fruit was transported under unfavourable conditions, reaching its destination in an overripe and wasty condition. Half the failures were due, not to the negligence of the engineer, but to the impossibility of maintaining correct temperatures throughout the cargo owing to the wrong installation of systems for distributing the refrigeration. These defects were being remedied in the newer types of ships. He was greatly impressed by the interest shown by the officers of the ships, who had a desire for information that would assist them in their endeavour to transport the product overseas and deliver it in good condition.

Prior to the advent of refrigeration there was no profitable outlet for the surplus of perishable produce, the production being restricted to the requirements of the people. Refrigeration, in addition to retarding the ripening process, was equally important in checking any tendency towards decay. Practically every case of decay known to the trade developed from some minute organism, either bacterial or fungal. Most of the organisms throve at ordinary temperatures, and became dormant at temperatures about freezing point. How soon the conditions necessary for the safe transport of fruit were attained in a ship's hold was still only a matter of conjecture. Investigations extending over a long period tended to demonstrate that the sooner the fruit was cooled after picking the longer it could be preserved in storage. The interval between picking and the ultimate cooling in the ship's hold might sometimes extend to several weeks, which greatly reduced its storage life, resulting in rapid deterioration owing to the relatively high temperature to which the fruit has been exposed in its early stages.

The value of pre-cooling before shipment had not been fully recognised, although it was admitted that cooling a large body of closely stowed fruit on shipboard was a big task, and weeks might elapse before favourable conditions were obtained owing to the difficulty of conveying the refrigeration uniformly throughout the cargo. The alternative was to pre-cool the fruit before shipment and thereby place it on the vessel in an ideal condition. Scientific and practical investigations agreed that pre-cooling before shipment was beneficial.

Objections were raised at this point owing to the financial aspect and the fact that many cargoes were landed overseas in good condition, but in what might be classed a good shipment there was always a proportion of damage which, if prevented, would justify the expenses incurred. In the course of time improved methods of handling the fruit up to the time of closing the hatches would be evolved, which, it was hoped, would include pre-cooling. Although fruit from the Dominion had reached a high standard, it was to the future we had to look in order to maintain the position.

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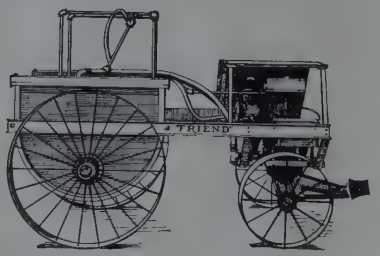

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FRUIT AND VEGETABLE MARKETING

INVESTIGATION BY PARLIAMENTARY COMMITTEE.

The inquiry into methods of marketing fruit and vegetables in the Dominion which is being undertaken by the Industries and Commerce Committee of the House of Rrepresentatives was opened on August 7th. Among the first witnesses were those who presented evidence organised by the Internal Sales Committee of The N.Z. Fruitgrowers' Federation.

When the Committee commenced to take evidence on August 7th., the first witness was Mr. J. A. Campbell, Director of the Horticultural Department, who outlined the difficulties of marketing in New Zealand. He considered that, if the methods of distribution were improved, and the fruit sold at a reasonable price the people could consume all the fruit grown in the Dominion. The trouble with fruit, however, was that it was not a necessity, and purchase was often brought about by suggestion. A man saw fruit displayed in a window and went into the shop and made a purchase. He thought that if the number of shops were reduced, less fruit would be consumed. He had a lot of sympathy with the fruit retailer in the prices he charged, because he had to face losses that were not common to other retailers. There was no doubt that some—not all by any means— of the fruit and vegetables for the market were packed dishonestly, and this was another obstacle for the retailer. The volume placed on the market daily made it impossible for a comprehensive inspection to be made. One of the improvements suggested by the retailers was compulsory standardisation, but it would take a heavy staff to ensure that the scheme would be carried out. However, it was carried out in parts of Canada and the United States. It was essential something be done in order to prevent the inferior being covered by the better class product at the markets.

Mr. Campbell said that in some of the centres in England the growers had associations which stamped the fruit and vegetables as coming up to a certain standard, and if a grower did not comply with the standard he was disqualified from the Association. They depended on the stigma of disqualification to maintain a standard. He considered that it was essential that a minimum standard should be fixed in New Zealand for products on the open market.

Mr. D. G. Sullivan (Labour, Avon) asked whether the gulf between producer and consumer was as great in other countries as it was in New Zealand, and whether public markets would not obviate the difficulty.

Mr. Campbell replied that he did not think the gulf was greater here than it was in some of the other countries. He thought that there was something to be said for the open market, which, he considered, would not interfere with the retailer.

In reply to Mr. J. S. Fletcher (Independent, Grey Lynn), Mr. Campbell said that the Department was in close touch with the producer and the trader and on friendly terms with both, but it was impossible under the present conditions to formulate an adequate system.

Mr. A. Harris: "With reference to the dishonest packing, who are the chief offenders, Europeans or Asiatics?"

Mr. Campbell: "Asiatics, but not entirely."

STANDARDISATION ESSENTIAL.

Mr. W. A. Tait, chairman of the Internal Sales Committee of The New Zealand Fruitgrowers' Federation, said that in their opinion standardisation was the crux of the position, but they desired a bureau of statistics of the conditions in various parts of the Dominion. To-day the fruit markets were in a state of chaos, because there was no means of eliminating inferior varieties. Thus at the height of the season the market was often glutted with poor fruit which caused the prices to fall below the costs of production. Standardisation should be applied to the grower as well as the trader. Voluntary schemes had been attempted, but had failed in England and Australia and had given little satisfaction in America. It had been found that voluntary systems failed because of the destructive powers of a small minority, and it was generally agreed that compulsory standardisation was the only real remedy. They considered that standardisation should be applied only to that fruit sold by the auctioneer and not that sold privately by the grower to the retailer. It was first essential to ascertain the amount of fruit grown and the amount consumed in the Dominion.

INFLUENCE OF INFERIOR FRUIT.

Mr. Tait said that if all the growers packed as they did for export half of their troubles would be over. Great quantities of inferior fruits always interfered with the prices of the best, and his Committee was anxious that something be done.

In answer to a question by Mr. H. Holland (Reform, Christchurch North), he said that he was not in favour of price fixation, but he was in favour of Mr. Campbell's proposal to fix a minimum quality.

Mr. H. Harris (Reform, Waitemata): "Would standardisation appreciably raise the price of fruit?"

Mr. Tait said that the growers were not out for big prices, but wanted only a fair profit over production costs. Standardised fruit might bring better prices at certain times of the year.

Mr. A. E. Ansell (Reform, Chalmers) asked who should bear the cost of standardising fruit?

Mr. Tait replied that it should be borne equally by the growers and the retailers. However, the system would be of benefit to the growers, even if they had to bear the whole cost alone. Standardisation would

A section of one of the apple stores at King George Dock, Hull.

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facilitate marketing and selling. Canterbury and Wellington were the two most undisciplined provinces in New Zealand, solely because they were not exporting.

AUCTION METHODS CRITICISED.

At the resumed meeting on August 15th. Mr. J. Dicker, one of the Directors of The New Zealand Fruitgrowers' Federation for Nelson, said that the growers of his province wished to protest against some of the practices prevailing in the trade in connection with the sale of fruit by the wholesalers, and to a lesser extent by the retailers. In the wholesale fruit market the bid was given by signs, and it was not audible. By reason of this practice traders were unable to determine if the buyer was always the highest bidder. Again, the auctioneer sold fruit, forwarded to him for sale to others, to a representative of the firm for resale. Thus, he made two profits, commission on the first sale and a profit on the resale. This practice sometimes deprived other buyers present from paying a higher price than the price at which the fruit was knocked down to the firm's representative. Another practice of the auctioneer was to clear the auction floor of considerable quantities of fruit at low prices to make room for fresh arrivals. A further cause of loss to the grower was the prevention of competition in bidding by selling to one bidder buying on behalf of many.

AN URGENT NEED.

The Nelson growers wished to stress the urgent need for standardisation of all pip fruit sold for resale, said Mr. Dicker. It was contended that the absence of any recognised standard grades was responsible for careless and false packing, and for the low price offered by retailers at auction because of the lack of knowledge or any guarantee of the contents of the package. It was contended that standardisation of all fruit sold (with the exception of fruit bought from the grower at the orchard and consumed by the buyer) would at once place the marketing of fruit in the Dominion on a satisfactory basis, benefiting grower, wholesaler and consumer. The whole of this work could be done by the Export Board with a small addition of staff. The cost of the Board at present was 2d. per case to the grower. Under such a system gluts and short supply, with consequent losses, would be avoided. At present a buyer in any of the overseas markets could buy a thousand cases of any of the New Zealand grades of export fruit and know exactly what he would receive before the fruit left the shores of New Zealand. In the same way, with standardised fruit on the Dominion markets, a local buyer could order fruit with assurance.

"TOO MUCH RUBBISH."

Mr. A. W. Cone, a Director of the Canterbury Fruitgrowers' Federation, also advocated standardisation. There was too much rubbish sent to the market, which should be sent to a by-product factory, as such fruit depressed the market and caused a decline in the

demand for fruit, as its appearance was so uninviting that the public would go without sooner than buy it. The importation of the majority of the fruit into the Dominion was quite unnecessary, as the local growers could supply more than the Dominion's requirements. There should be a prohibitive duty on all fruit, fresh and preserved, that could be grown here, thereby finding more work for our population, and keeping a large amount of money in New Zealand.

Mr. C. A. Wilkinson (Egmont): "Is it considered that suitable case timber is not obtainable in New Zealand?"

Mr. Cone said that there was no guarantee of delivery, and the quality of the timber was not satisfactory. They would not import a single case if they could be satisfactorily supplied within the Dominion.

Mr. H. Holland (Christchurch North), asked whether it was a fact that the reason for a large amount of rubbish on the market was that the best fresh fruit was exported.

Mr. Cone: "No."

Mr. Holland: "Do you think the retailers are getting an undue profit?"

Mr. Cone: "I do. I think that if the fruit were cheaper the public would buy more."

FRUIT CONTROL ACT.

Mr. R. Paynter, representing the Hawke's Bay fruitgrowers, considered that the greatest need of the industry was compulsory standardisation. The grower needed it because he desired each grade to be sold on its merits. The grower who grew low-grade fruit could find a market with the cider makers and others who required fruit for pulpers. Standardisation should apply not only to the growers, but to the retailers, who should be compelled to sell the fruit under their respective grading marks, and so protect the consumer as well as the grower. The Fruit Control Act of 1924 contained all they desired for standardisation, but the voting basis was so undesirable that a grower merely abstained from voting and his action was counted against the proposal. This made it very difficult to bring standardisation into effect. The growers suggested an amendment to the Act altering the system of vote counting, and making the votes apply only to those who exercised their vote, so that 60 per cent. of votes polled would bring the Act into operation. Failing an amendment along these lines, they would advocate a Standardisation Act. In either case it would be a starting point for the fruitgrowers to commence putting their house in order. A bureau of statistics was an urgent necessity. Crop estimates should be prepared and a careful inquiry should be made into local consumption.

BEARING THE COST.

Mr. Holland: "Who would bear the cost of the standardisation scheme?"

Mr. Paynter: "The growers would be prepared to bear a big part of it." He said that under standardisation the grower would grade his own fruit, as he did now for export. He would be liable to have his fruit inspected at any time and this would keep it up to standard.

Mr. A. E. Ansell (Chalmers): "How do you propose to make standardisation effective with the retailers?"

Mr. Paynter said that the retailer would have to "ticket" his fruit with the grade and he would be also liable to inspection. They had honourable retailers, just as they had honourable growers.

Mr. Ansell: "Unfortunately we have to legislate for the dishonest man."

QUALITY OF CASES.

Mr. Paynter did not think all imported fruit should be prohibited, but the growers should have reasonable protection. The sawmillers at the present time could not supply all the cases required, but had stated that they would be able to meet the demands within two years.

Mr. Wilkinson: "Is the quality of the New Zealand case equal to the imported case?"

Mr. Paynter: "No. The *pinus insignus* cases supplied in New Zealand are not as good."

Mr. Wilkinson: "Are there any other woods suitable?"

Mr. Paynter: "Yes. There is white pine, but the sawmillers state that they can't supply white pine, as it pays them to export it."

Mr. Wilkinson: "We are told that the millers have millions of feet of timber that they cannot sell. It seems to be an extraordinary position."

Mr. Harris: "How many grades do you suggest?"

Mr. Paynter: "Four, including a black spot grade. We do not think we should be barred from putting a black spot grade on the market provided it is not bad."

"DISASTROUS STATE OF AFFAIRS."

Mr. C. Ballantyne, representing the Internal Sales Committee of The New Zealand Fruitgrowers' Federation, said that the prices realised on the local markets, even for the best grades, were far below those which gave a reasonable return. The costs involved in the marketing were so high. They were of the opinion that standardisation was the solution of the difficulty, and he also advocated an amendment to the Fruit Control Act. When a poll was taken some years ago, 75 per cent. of those on the roll did not vote. The control of imported fruits seemed to loom just as largely as did the control of locally-grown fruit. The present state of affairs was so disastrous to the growers that he himself would be willing to have his poor pear trees rooted out if that could be done without cost to himself, and he could guarantee to produce a crop of apples, 90 per cent. clean, and to sell that crop at a halfpenny per lb. on the tree.

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AUCKLAND, HASTINGS, WELLINGTON, PORT NELSON, CHRISTCHURCH.

Mr. Wilkinson: "Somebody must be making a profit."

Mr. Ballantyne: "Yes, that is so."

Mr. Ballantyne said that the difficulty of selling direct to the public was that the growers were not willing to co-operate. The sawmillers of the Dominion were not in a position to supply all the cases required.

Mr. D. G. Sullivan (Avon): "Have you conferred with the sawmillers on this matter?"

Mr. Ballantyne: "Yes. They admit candidly that they can't supply them." He said that the wood in the New Zealand cases often contained moisture, which made them unsuitable for exportation.

Mr. Sullivan said that they had had representations from the New Zealand sawmillers stating that they were anxious to supply the cases.

Mr. Ballantyne said that he would buy New Zealand cases if they were suitable.

Mr. Sullivan: "I think representatives of both sides should be locked up in a room and given only bread and water until they have settled their differences."

Mr. Ballantyne said that the Auckland province was capable of growing large quantities of citrus fruits, and he considered that the industry should be encouraged by the placing of a heavy duty on American oranges and lemons. He did not think that any tariff should be placed on island fruit.

"What I am asking for, what we are all asking for," he said, "is a chance to work out our own salvation. Amend the Act and give us a democratic system of voting."

In reply to Mr. Ansell, he said that the cost of drying the timber was a stumbling block to the sawmiller in supplying suitable cases.

TOMATO AND STONE FRUITGROWERS.

Mr. C. E. Pope (Christchurch), representing the Christchurch Tomato and Stone Fruitgrowers' Association, and the Dominion Council of Tomato, Soft Fruit, and Producers' Association, stressed the need for more sanitary arrangements at the auction rooms. He considered that for economy purposes a central auction room was desirable, and his association was in favour of all cases being branded with grade, growers' registered number or brand, and variety of fruit, and that standard cases should be adopted for the various classes of fruit.

A BRIEF INVESTIGATION.

Mr. M. J. Reardon, Secretary of the Wellington Fruit Retailers' Association, asked whether the Committee was going to sit in the recess.

The chairman replied that Cabinet had decided against that proposal.

"We have waited ten years for this inquiry," said Mr. Reardon. "I know that during the session a member of Parliament has a tremendous amount of work to do, and in view of the very wide order of reference and the importance of the problem, I do not think the Committee can adequately deal with it."

CHARGING FOR FRUIT CASES.

Results of Otago System.

We are indebted to the Co-operative Fruitgrowers of Otago Ltd. for the following comparative figures relating to charging for fruit cases, covering a period of five years. Details are also given of experience under the non-charging system.

The following table shows the quantity of fruit in half cases sold in the South Island under THE CHARGE FOR CASE SYSTEM.

Year	Half Cases	Valued at 4d. each
1925-26	220,007	£3,666 15 8
1926-27	169,740	£2,829 0 0
1927-28	237,977	£3,966 5 8
1928-29	248,338	£4,138 19 4
1929-30	year not finished	—
	Total receipts	£14,601 0 8

The table below shows, for purposes of comparison, the quantity of fruit in half cases sold in the North Island under NO CHARGE PER CASE SYSTEM, on account of the Otago growers:—

Year	Half Cases	Valued at 4d. each
1925-26	27,678	£461 16 0
1926-27	9,600	£160 0 0
1927-28	24,992	£416 10 8
1928-29	26,449	£440 16 4
1929-30	8,828	£147 2 8
	Value of cases	£1,626 5 8

The table below shows the quantity of fruit in half cases sold on account of North Island and Nelson consignors under the NO CHARGE PER CASE SYSTEM.

Year	Half Cases	Valued at 4d. each
1925-26	5,000	£83 6 8
1926-27	4,500	£75 0 0
1927-28	6,896	£114 18 8
1928-29	5,855	£97 11 8
1929-30	4,238	£70 12 8
	Total	£441 9 8

HAWKE'S BAY FRUITGROWERS' ANNUAL SOCIAL.

The annual social and dance of the Hawke's Bay Fruitgrowers' Association was held in the Assembly Hall, Hastings, on Friday evening, 18th. July, and may certainly claim to have been a success. There must have been fully 500 people present, and one and all entered fully into the enjoyment of the programme submitted. The Committee of the Association had spent some time in making the necessary preparations, and it must have been extremely gratifying to them to see the response of growers and friends. The only difficulty was the severe strain such a response made upon the commissariat department.

During the evening, dancing, interspersed with musical items, was indulged in under the direction of Mr. Butler, of Havelock North. Those contributing to the musical programme were Misses Bullen and Harrison, and Messrs, N. J. Adamson and A. Robertson, while Miss Benton played the accompaniments. For the non-dancers, a 500 card tournament was conducted by Messrs. G. T. H. Joll and A. J. Bale, the prize-winners being Mesdames W. Taylor and Walker, and Messrs. R. W. Russell and E. Farmery, while Master Eric Bodley won an autograph competition.

The statement "pays for itself" is often enough true in substance and in fact, as was recently proved by a fruitgrower when he stated: "Am very pleased with the grader, only regret is that I did not have it last year when I could have nearly saved its cost by paying less wages."

CANTERBURY FRUITGROWERS.

Mr. E. Freeman presided over a good attendance of members at the last monthly meeting of the Canterbury Fruitgrowers' Association.

The Secretary was instructed to write to the Government Meteorologist, stressing the necessity of providing special broadcasts of frost forecasts, during the spring seasons, when the orchards are endangered by frosts. Also to point out that a late frost last season completely destroyed the Canterbury apple crop.

It was decided, on the recommendation of The New Zealand Fruitgrowers' Federation, to set up a committee to go into the question of forming a Pear Growers' Association, to advance the more effective marketing of pears, both overseas and within the Dominion.

The Minister for Internal Affairs, the Hon. P. A. de la Perrelle, wrote acknowledging receipt of the Association's letter regarding duties on the importation of fruits into the Dominion. It was decided again to communicate with the Minister, stressing the need for the importation duties on fruit, including the dried fruits, particularly from Australia and South Africa.

"HEAVY RAIN PREDICTED"

The next few months will be trying ones for farmers. What will you do? Waste time indoors, or get a "Caterpillar" and work ahead as usual?

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CORRUGATED STRAWBOARD.

Decisions for Next Season.

The Executive Committee of the Fruit-export Control Board has come to some important decisions affecting the method of packing during next export season. Its resolutions on the subject are as follow:—

"(1) That all apples for the Continent be packed in the wrapper type of corrugated strawboard.

"(2)) That all Cox's Orange Pippin for the United Kingdom be packed in the wrapper type of corrugated strawboard.

"(3) That all other fruit of sizes 125 and larger be packed with corrugated tops and bottoms."

Messrs. Brown, Stephens and Napier are agreed that corrugated strawboard should be generally used. They are of course aware of the opinion of many growers who have doubted the necessity and questioned the financial advantage of this system, but these authorities, who have a better knowledge of the marketing end than we can possess, are unanimous. In view of the decisions of the Control Board Executive, we have made inquiries regarding the price of corrugated strawboard, and we find that the ordinary pad costs a halfpenny per case, and that corrugated strawboard for tops and bottoms would cost 1¼d., and the all-round wrap 2½d. per case. These prices are relative, as there are slight differences according to delivery point. No doubt this question will receive attention at the coming export conference, when Mr. Brown will be present.

Our Nelson correspondent has some comment to make on this question. The cable recently received from Messrs. Brown, Napier and Stephens, Chairman of the Control Board, Manager of The Federation, and Overseas Representative, requesting the substitution of strawboard for the plain pad at present in use, has, he writes, set the growers thinking and talking about the condition of their fruit on arrival overseas. It is generally agreed that the present pad is useless for the prevention of bruising. It saves the apple from an abrasion on the skin when in contact with rough-sawn timber, and also cutting from a two-piece lid when under the press. The strawboard serves the same purpose as the pad, and in addition helps to minimise the bruising.

At a meeting of the Hills Union, a lively discussion took place concerning the matter, resulting in a request for further evidence of the advantages claimed for the strawboard. It was stated that bruising took place often before the fruit left some packing sheds, due to excessively high packing. It was also stated by some that the fruit could be heard to crush whilst such overfilled cases were under the press. Other growers claimed to have seen fruit opened up on return from the inspection depot in cases where it had been rejected for deficiency of colour, when all the apples in the case were more or less bruised. Large-sized Sturmer apples have been taken from cases on the Wellington wharf with bruises as big as half-crowns, caused in some cases by growers trying to put the hundred size in a hundred and thirteen pack.

A further objection to the voluntary use of strawboard is the pooling in practice at Home, which would deprive the man who has incurred the additional expense of strawboard from the benefit due to him. The innovation, if adopted by all, will cost the growers of this province over £3,000 over present costs in a season's export.

The Nelson shippers attach great importance to any recommendation coming from their accredited representatives overseas, but nevertheless are of the opinion that steps should be taken to find out to what extent the bruising, which is the principal reason for the adoption of strawboard, can be avoided prior to shipment, and that before putting the growers to any extra expense, a series of well-arranged experimental shipments should be carried out to demonstrate beyond doubt that increased prices are obtainable from strawboard-lined cases of fruit.

The writer was shown a letter just received by a Nelson grower from a firm of brokers to whom he consigns his fruit. One of the principals of the firm therein stated that "after personal inspection of your consignments and a comparison with other consignments from the same port, your fruit opens up in a much better condition than the others. This I attribute to the consistent use by you for several seasons past of strawboard." Here again careful packing may have had more to do with the excellent result obtained.

The Redwoods Valley growers, after consideration of the proposal, requested that decision should be deferred until the next Export Conference, when Mr. Brown and Mr. Napier would probably be present. The Motueka Association decided against compulsion and favoured a strong recommendation for the use of strawboard by their members for the coming season's export. The whole position may be altered, if the Strawboard Manufacturing Company of Timaru, now in course of flotation, is able to supply the growers of the Dominion with a suitable pad at a cost much below the price of the imported article.

IMPERIAL FRUIT SHOW AWARDS.

Results of the Imperial Fruit Show competition (Southern Hemisphere section), previously dealt with in these columns, are as follows:—

Class I.—1st. prize, Miss U. Stephens, New Zealand (variety Jonathan); 2nd. prize, H. Lake, Western Australia (variety Grannie Smith); 3rd. prize, A. G. Taylor, South Africa (variety Permain).

Class II.—1st. prize, J. Green, South Africa (variety Rokewood); 2nd. prize, H. Lake, Western Australia (variety Democrat).

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EXPORT REALISATIONS.

The Survey of Export Averages.

Following the article in our August issue which discussed market conditions overseas and gave some valuable details of the average realisations to that date, based on actual account sales, we are able to continue the survey by including results from a further series of shipments.

The averages given below have been worked out from account sales, and represent average c.i.f. prices. Details are as follow:—

CUMBERLAND.

Bristol.

	C.I.F. Av.	Cases.
Jonathan	11/10	228
Dunn's	9/8	92
Cox's Orange Pippin	13/3	126

Birmingham.

	C.I.F. Av.	Cases.
Jonathan	11/4	1,095
Dunn's	11/7	42
Lord Wolseley	10/8	581
Cleopatra	13/6	25

Manchester.

	C.I.F. Av.	Cases.
Jonathan	11/2	148
Lord Wolseley	12/6	23
Delicious	14/–	2
Dunn's	11/10	79
Cox's Orange Pippin	12/8	5
London Pippin	9/8	3
Adam's Pearmain	11/–	51

Newcastle.

	C.I.F. Av.	Cases.
Jonathan	12/4	10
Dunn's	10/6	586
Cox's Orange Pippin	14/6	97
Alfriston	9/11	150

London.

	C.I.F. Av.	Cases.
Jonathan	11/4	5,661
Cox's Orange Pippin	14/4	5,526
Dunn's	10/–	3,376
Delicious	12/6	360
London Pippin	8/11	529
Adam's Pearmain	9/8	235
Shoreland Queen	10/–	59
Premier	8/11	21
Lord Wolseley	9/8	986
Cleopatra	11/1	417
Alfriston	10/10	163
Parlin's Beauty	10/8	39
McIntosh Red	7/4	45
Blenheim Orange	9/11	266

PORT BRISBANE.

Bristol.

	C.I.F. Av.	Cases.
Dunn's	9/6	19
Jonathan	11/6	87
Cox's Orange Pippin	15/10	22
London Pippin	10/10	5

London.

	C.I.F. Av.	Cases.
Dunn's	10/5	1,012
Jonathan	12/1	2,396
Delicious	12/5	895
Cox's Orange Pippin	14/9	6,334
Lord Wolseley	10/5	304
Blenheim Orange	10/5	20
Cleopatra	12/10	6
London Pippin	9/1	73
Adam's Pearmain	10/10	38
Simmond's Winter	10/6	7
Shepherd's Perfection	10/3	8
Shoreland Queen	9/8	32
King David	10/8	2

Southampton.

	C.I.F. Av.	Cases.
Dunn's	11/1	26
Jonathan	12/11	305
Delicious	13/10	148

PEARS.

	Crates Trays		Crates Half Cases	
Packham Triumph	9/9	28	9/5	183
Beurre Bosc	12/3	265	9/5	352
Winter Cole	12/1	75	12/5	335
Vicars			10/9	34
Beurre Capiaumont			12/5	94
Beurre Diel			10/11	75
Doyenne du Comice			18/1	113

MATAKANA.

Edinburgh.

	C.I.F. Av.	Cases,
Sturmer	10/5	413
Jonathan	11/9	2,712
Lord Wolseley	8/11	51
Cox's Orange Pippin	17/1	1
Premier	9/1	13
Brownlee's Russet	7/8	62
Delicious	12/6	2,029
Boston Russet	10/4	45
Dunn's	9/11	528
Cleopatra	11/10	19

	Crates Trays		Crates Half Cases	
Vicar of Winkfield	6/5	100		
Packham's Triumph	7/11	153	8/9	72

Cardiff.

	C.I.F. Av.	Cases,
Sturmer	12/5	162
Delicious	13/2	312
Dunn's	12/5	92
Boston Russet	12/–	5
Jonathan	12/5	29

Glasgow.

	C.I.F. Av.	Cases,
Jonathan	11/1	4,644
Delicious	12/5	4,849
Cleopatra	11/11	42
Dunn's	10/1	1,277
Lord Wolseley	10/1	479
Cox's Orange Pippin	9/1	26
Willie Sharp	10/2	6
Stayman's Winesap	9/11	11
Parlin's Beauty	9/4	272
Brownlee's Russet	8/7	39
London Pippin	9/11	18

	Crates Trays		Crates Half Cases	
Packham's Triumph	7/3	149	6/4	25
Doyenne du Comice	15/6	132	14/6	23

Liverpool.

	C.I.F. Av.	Cases,
Delicious	12/4	3,948
Parlin's Beauty	10/3	50
Shepherd's Perfection	10/6	20
Simmond's Winter	11/1	28
Dunn's	11/7	1,944
Jonathan	11/9	6,143
Lord Wolseley	11/5	578
Adam's Pearmain	11/4	61
Alfriston	11/9	57
King David	11/1	15
London Pippin	10/10	108
Cleopatra	15/5	220
Shoreland Queen	11/9	150
Premier	11/2	52
Cox's Orange Pippin	15/–	11

Bristol.

	C.I.F. Av.	Cases,
Dunn's	11/2	1,198
Delicious	11/8	1,485
Jonathan	11/3	3,696
Cox's Orange Pippin	17/8	377
Shoreland Queen	11/1	11
Boston Russet	9/5	57
King David	10/9	13
Cleopatra	11/8	101
Lord Wolseley	10/3	20
McMahon's White	11/1	4
London Pippin	10/11	74
London.		
Dunn's	10/7	104
Jonathan	12/8	1,124
Blenheim Orange	10/7	61
Delicious	12/4	465
London Pippin	9/5	27
Adam's Pearmain	11/–	7
Cleopatra	12/–	56
Lord Wolseley	9/9	37
Shoreland Queen	11/1	2
Senator	9/3	4

No further Hawke's Bay and Poverty Bay pools have been completed at time of publication, therefore we are unable to give later information than that published in our last issue.

The mind I sway by,
And the heart I bear,
Shall never sag with doubt,
Nor shake with fear.

—Shakespeare.

RANGIORA FRUITGROWERS.

Nearly twenty years ago the first Rangiora Fruitgrowers' Association was formed, and for some years before the planting of the Loburn orchards, regular monthly meetings of fruitgrowers were held in Rangiora. Later on, as orchardists settled at Loburn, they became members of the Rangiora Association. The Loburn growers, however, being in a majority, eventually had the place of meeting transferred to Loburn, and the name of the Association altered to the Loburn-Rangiora Fruitgrowers' Association.

The difficult of attending meetings at Loburn and the need of local organisation to deal with matters in connection with the progress of the industry led to several informal meetings being held by Rangiora growers, and as a result a new Association has been formed and registered under the Industrial and Provident Societies Act, with the name of "The Rangiora Fruitgrowers' Association Limited."

The first general meeting of the Association was held on Wednesday, August 13th., nine members being present, and apologies for absence being received from Messrs. S. G. Brister and F. Smith. The election of officers resulted as follows:—President, M. C. Ormandy; Vice-President, S. G. Brister; Secretary and Treasurer, N. Goldsbury; Committee; J. W. Shields, P. H. Watkins, J. Smith, J. A. Miles, J. C. Banfield, J. L. Marsden, and W. W. Rhodes; Auditor, S. G. Dalley.

The Secretary was instructed to write to The N.Z. Fruitgrowers Federation for information relating to affiliation with that body.

It was decided that letters be sent to the Cawthron Institute, Nelson, and also to the United States Department of Agriculture for information regarding experiments conducted by them in connection with fruitgrowing.

The date of holding regular meetings was fixed for the third Thursday of each month.

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ORCHARD COOL STORES.

A Practical Guide to Fruitgrowers.

(By R. Sutherland, Cool Storage Officer, Horticultural Division, Department of Agriculture.)

The erection of a cool store having a capacity of 1,000 cases is as important as one for ten or twenty thousand cases, with regard to the structure, insulation and the installation of a suitable refrigerating plant.

The year 1930 finds prolonged cool storage of fruit no longer an experiment, especially as regards apples and pears, and many small stores are operated by men without much mechanical experience. This does not mean that anyone can build and equip a cool store with machinery, but that a store, properly designed and fitted with a suitable refrigerating plant, will, if proper temperatures, humidity and atmospheric conditions are maintained within the storage rooms, keep the fruit over the requisite period between seasons to enable the grower to show a profit on his outlay.

The question of having a cool store at all is no longer a doubtful one—it is a necessity. A grower who can store two or three thousand cases will require a small cool store for his own use. As previously mentioned, the erection of a cool store is an important matter. If the grower has a suitable shed which he intends to convert into a cool store, it has to be remembered that this is only the shell of the structure, and the storage room has to be built inside. The thickness of the walls will depend upon the class of insulation used. If the building is of wood, the walls, ceiling and floor must be double-lined with ¾ in. and ½ in. T. and G. lining, with a layer of three-ply paraffin paper in between.

Space enclosed by walls which have been well insulated can be readily reduced in temperature and easily kept cool. The more carefully and effectually the heat is excluded, the smaller will be the demands on the power supply, and the greater will be the return on the capital invested. For this reason the insulation, like the machinery, should be looked upon as a permanent investment. The expenditure is made once and for all, while in the absence of good insulation the flow of heat which will take place is continuous and unceasing. It is not desired or intended to recommend that first cost should be lost sight of, or that unnecessarily elaborate precautions should be taken to keep out the heat.

IMPORTANCE OF GOOD INSULATION.

The whole question is one of capital account. If the insulation is scanty, and it is difficult to keep the necessary temperatures, so many extra tons of refrigeration, and consequently so many extra units of power, besides oil and other stores, are required each year, which reduces the return on the outlay. On the other hand, if the insulation is good, the working charges are less, owing to the units of power saved.

When cool store buildings are built entirely of wood, the main walls are formed by 10 in. x 16 in. studs placed at 12 in. centres. One the weather side of these ½ in., then ¾ in. tongue and grooved match-boarding breaking joints are laid with paraffin paper in between, and on these again the ordinary weatherboarding is nailed. On the inside of the 10 in. x 1½ in. studs ½ in., then ¾ in. T. and G. matchboarding, with paper in between, is again fixed. In all cases the spaces between the 10 in. x 1½ in. studs are filled with buzzer chips, pumice, silicate cotton, granulated cork or perhaps some other local insulating material.

If the structure is of concrete, 4 in. of cork slabs are used, and then faced on the inside with cement.

THE REFRIGERATION PROCESS.

Usually when small cool stores are to be operated by men without mechanical experience, the system of cooling employed is direct expansion, which consists merely of a coil of pipes, placed on the walls of the room, in which the ammonia expands and absorbs the heat and produces the refrigerating effect. The ammonia is expanded directly into the coils, and is drawn through them by the action of the compressor. As the ammonia expands in the coils, the temperature of the pipes is rdeuced, and the moisture from the air is deposited upon them in the form of snow. This, of course, dries the air. The snow is thawed off from time to time, the water being carried away by drains constructed underneath the pipes.

Direct expansion chambers may be any length, but the width is limited according to the height, i.e., 8 ft. high, 20 ft. wide or less, allowing 12 in. clear space between the direct expansion coils and the cases, and ½ in. spaces between the cases themselves. The total size of a chamber having a capacity for 2,000 cases is 30 ft. x 21ft. x 9 ft. 3 in.

AIR-COOLING SYSTEMS.

Refrigerated storage is the ideal storage, and any other method of keeping fruit in long storage is not recommended. However, owing to force of circumstances, many growers are not able to avail themselves of cool storage facilities. The alternative, therefore, is to cool the fruit as quickly as possible, taking advantage of the reduced air temperatures which occur at night during the picking season. The average temperature of apples during the picking season is around 70° F. If the apples are stored immediately in common storage, the natural circulation of air will carry away the heat very slowly.

Attempts have been made to use a fan for ventilating the rooms, the air being discharged into the room at one end and allowed to vent out at the other. This cools the air in the room, and the apples on top of the stack. However, the temperature of the fruit in the centre is affected very little.

As it is important that the air be brought into contact with the apples, the best method is to apply the air under a false floor and force it up through the cases stacked thereon. The most successful plan is to install a power-driven fan of ample capacity to deliver the cold night air under the false floor and up through the stack of fruit. The discharge of the air after passing through the apples may take place through ventilators in the roof. The reduction of the temperature will be in proportion to the volume and temperature of the air circulated. To reduce the temperature 1° F. we must reduce 55 cubic feet of air 1° F.

A very large volume of air is necessary to reduce the temperature of a case of apples from 70 to 50 F. The heat capacity of a pound of apples is .95. Therefore, in cooling one pound of apples 20 degrees (from 70 to 50), the number of British thermal units of heat which must be carried away by the air would be 20 times .95, which would be equal to 19 degrees. To carry away this amount of heat would require 19 times 55, which equals 1,045 cubic feet to be changed 1 degree in temperature.

If a case of apples weighs 40 pounds, then 1,000 cases will weigh 40,000 pounds, and to cool this amount of apples 20 degrees would require 10,450,000 cubic feet of air, if the temperature of the air, in passing through the apples, is raised 4 degrees.

These figures show the futility of attempting to accomplish any material cooling by the use of a propeller type of fan in an opening at one end of the building. Great quantities of air must be blown through the cases. This can best be accomplished by delivering the air under a false floor, forcing it up through the closely stacked cases.

Where the fruit has a tendency to wilt, due to low humidity, the moisture content of the air can be increased by passing the air over baffles of canvas kept wet continuously. The evaporation of the water in the air draught has the additional advantage of lowering the air temperature before it strikes the apples.

Cooling by the orchardist is of primary importance, and should be practised by every grower, whether he owns his own cool store or forwards his fruit to a commercial store for cooling.

Common storage rooms are more effective if they are well insulated and the roof made of shingles or thatch. Ample provision should be made for the air to escape from the building after it has passed through the fruit; this may be through roof ventilators or windows. The total area of the ventilators or air exits should be several times the area of the discharge opening of the fan itself.

NELSON HARBOUR IMPROVEMENTS.

Several meetings of growers' representatives have been held recently to consider harbour facilities for export, writes our Nelson correspondent. More accommodation at Port Nelson is urgently needed, and it is encouraging to the growers to find that members of the Harbour Board recognise that need, and at the conferences with the growers' representatives have manifested a live interest in the affairs of the industry and a willingness to help as far as possible.

Our ultimate aim is to ship all Nelson fruit direct from our own port to the overseas markets. This necessitates deeper water and more berthage improvements, involving an expenditure according to one estimate, of £150,000. During the present period of depression the flotation of such a loan is out of the question. The Board, however, are ready to provide an extra shed for assembling, sorting and inspection.

In view of the probable pre-cooling of all fruit for shipment overseas, it is proposed that the new shed accommodation shall form the nucleus of a cool store, if such is later required.

Just at this stage special knowledge of a technical character concerning the erection of cool stores is needed, and it is to the committee of experts that we look for guidance. As soon as our wants were known arrangements were at once made by Mr. Benzies (Acting-Secretary of the Control Board) to visit Nelson and confer with the local Fruit Advisory Board, so that what is done will be on the most approved lines, and such as will give the growers the best service. This is another instance of the fruits of organisation.

During the preparation of plans and preliminary negotiations, Mr. Sutherland and Mr. Thorp, of the Horticulture Division, and Mr. J. Brunt (Nelson shipping supervisor) rendered invaluable service.

This month's cover illustration pictures a pleasant gathering of Hawke's Bay orchardists on the occasion of a recent field day at Grasmere orchard, Hawke's Bay. The beautiful surroundings are well illustrated. Altogether about 80 growers and a fair sprinkling of ladies were present. Mr. Ralph Paynter, President of the H.B. Fruitgrowers' Association, spoke at some length upon the local market problem, and correctly predicted that the Dominion Conference would see a decided step forward taken in connection with this very important matter. Later events show that Mr. Paynter was no false prophet.

After the business part of the meeting had been disposed of, "Mess Orderlies" paraded and afternoon tea was served. This was followed by demonstrations of various tractors and cultivating implements, and a very successful gathering concluded with votes of thanks to the ladies, demonstrators and members of Grasmere orchard staff.

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